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Ministry of Energy and Mineral Resource
Republic of Indonesia

HANDBOOK OF ENERGY & ECONOMIC STATISTICS OF INDONESIA 2023

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Team Handbook

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Preface

The update on the Handbook of Energy & Economy Statistics of Indonesia, is an effort of the Center for Data and Information Technology on Energy Mineral Resources (CDI-EMR) to provide accurate and reliable data and information on energy and economy joined into a book. Such energy and economic data and information are kept by various sources, at many locations, and generally in avariety of formats unready for energy analysis. In addition, the data and information are generally not provided with sufficient explanation or clarification. The standardization of energy and economic data is a critical problem. Currently, researchers at various institutions, do not have common terminology on energy economy. In some cases, disagreement may arise over a different use of terminology. This subsequently leads to inaccurate energy analysis.

The Current problem related to energy data in Indonesia is the unavailability of demand-side data. To date, energy data are actually derived from supply-side data. In other words, consumption data are assumed to be identical with sales data. Such assumption maybe quite accurate, provided there is no disparity between domestic and international energy prices. The disparity in energy prices will contribute to the misuse of energy. Thus, the sales data of an energy commodity cannot be regarded the same as the consumption data of the commodity. For that reason, this statistics handbook, presents the energy consumption data made by computations based on a number of energy parameters.

We hope the process to standardize the energy and economic data and information in the future will be continued as a part of updating the Handbook, The CDI-EMR will continue to coordinate with all relevant parties within the Ministry of Energy and Mineral Resources (MEMR) as well as with statistical units outside the MEMR.

We would like to appreciate all parties involved for their thorough work and patience in preparing this book. May God the Almighty always guides us in utilizing our energy resources wisely for the maximum benefit of the Indonesian people.

Jakarta, May 2024
Head of Center for Data and Information
Technology on Energy and Mineral Resources

Introduction

This Handbook of Energy and Economic Statistics of Indonesia contains the data on Indonesia's energy and economy from 2013 through 2023. There are some revised data from the previous edition of the Handbook for 2013 to 2022. This handbook covering estimated energy demand of every sector. The tables and annexes are arranged as follow:

A. Tables

The tables are shown in 6 Main Categories, as follows:
- Table 1 Energy and Economic Indicators
- Table 2 Indonesia's Energy Balance Table
- Table 3 Energy Supply and Demand
- Table 4 Energy Price
- Table 5 Energy Demand by Sector
- Table 6 Energy Supply by Energy Resources

B. Annexes

Annex 1. Methodology and Table Explanation, clarifying the methodologies adopted in preparing the tables data.
Annex 2. Glossary, containing important terms used in the tables and the respective units.
Annex 3. Conversion Factors, presenting the list of multiplication factors used to convert various original units of energy into BOE (Barrel Oil Equivalent).

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Indonesia's Concise Energy Profile 2023

A.	**SOCIO ECONOMY[1)]**		
	Teritorial Area :	8,300,000.00	km^2
	Land Area :	1,892,410.09	km^2
	Population :	278,696.20	Thousand People
	Household :	71,592.46	Thousand Households
	GDP Nominal		
	Total Amount :	20,892.38	Trillion Rupiah
	Per Capita :	74,964.70	Thousand Rupiah per Year
B.	**ENERGY PRODUCTION**		
	Primary Energy Production		
	Crude Oil :	221,088.90	Thousand Barrels
	Natural Gas (net) :	2,420.06	BSCF
	Coal :	775,181.86	Thousand Tonnes
	Hydro Power :	24,589.40	GWh
	Geothermal :	16,935.73	GWh
C.	**FINAL ENERGY CONSUMPTION**	**1,237.43**	**Million BOE**
	Energy Consumption by Type		
	Coal :	316.75	Million BOE
	Oil Fuel :	492.16	Million BOE
	Gas :	120.99	Million BOE
	Electricity :	193.54	Million BOE

[1)] Sources : BPS, Statistics Indonesia

Briquette :	3.49	Thousand BOE
LPG :	74.25	Million BOE
Traditional Biomass :	16.65	Million BOE
BioGas :	0.70	Million BOE
Industrial Biomass :	20.45	Million BOE
Solar Water Heater :	1.92	Million BOE
Direct Use of Geothermal :	3.65	Million BOE
Energy Consumption by Sector (Excluded non energy use)	**1,237.43**	
Industry :	556.64	Million BOE
Transportation :	448.53	Million BOE
Household :	166.16	Million BOE
Commercial :	55.47	Million BOE
Other Sector :	10.62	Million BOE
Non Energy :	31.57	Million BOE

D.	**ELECTRIFICATION RATIO 2023**	**99.79**	**%**

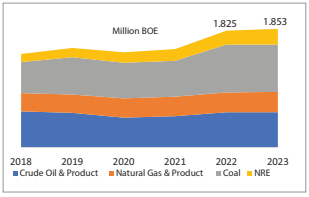
Executive Summary

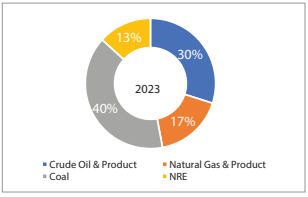
Key Highlight

1. Macroeconomics

In the midst of a global economic slowdown, in 2023 the Indonesian economy grew by 5.05% with per capita income reaching 74.96 million rupiahs per year, while the mid-exchange rate of the rupiah against the US dollar was recorded at Rp. 15,416 in 2023. Indonesia's population in 2023 reached 278 million people with 139 million people employed. The unemployment rate decreased from the previous year to 5.6% of the total population.

2. Primary Energy Supply

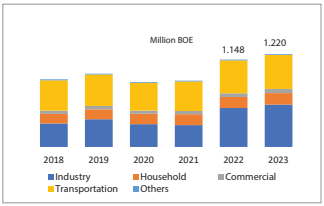


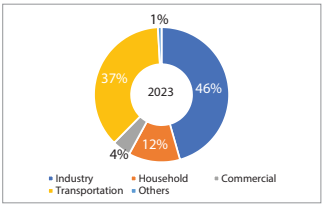


In line with the growth of the Indonesian economy, Indonesia's energy supply in 2023 will also increase by 1.55% from the previous year with a value of 1,853 million BOE or the highest in the last six years. The supply of fossil energy such as crude oil and products and coal experienced a slight decline from the previous year, while natural gas and renewable energy (NRE) products experienced an increase of 3% and 13.8% respectively from the previous year. The primary energy mix is still dominated by coal at 39.69%, followed by petroleum at 29.91%, natural gas at 17.11%, and NRE at 13.29%. The NRE mix is targeted to reach 23% by 2025.

3. Final Energy Consumption

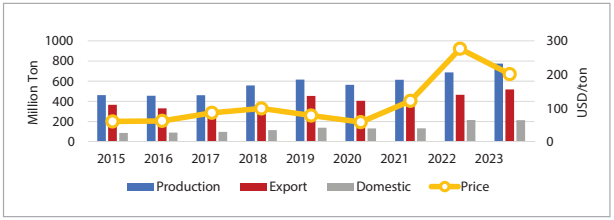
On the energy demand side, there was an increase in energy consumption reaching 6.29% or 1,220 million BOE. Similarly to energy supply, consumption in 2023 was the highest in the last six years. In 2023, the industrial sector had the highest share in energy demand per sector at 45.60%, followed by the transportation sector at 36.74%, households at 12.35%, commercial at 4.44%, and other sectors at 0.87%. The dominance of the industrial sector in energy demand in 2023 was driven by the absorption of coal and natural gas consumption in the industrial sector.





In 2023, the share of coal in energy consumption in the industrial sector was the highest at 56.90%, followed by gas at 21.41% and electricity at 12.7%.

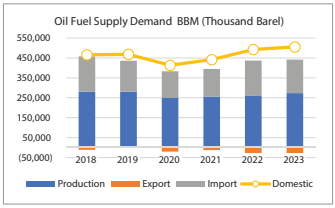
4. Coal

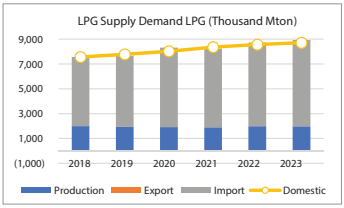


Coal production in 2023 amounted to 775 million tons, an increase of 13%, while exports were 518 million tons or an increase of 11%. The highest export destination country was China with a volume of 218 million tons. There was a slight decline in domestic coal sales, which amounted to 212 million tons, down 1.3% compared to the previous year. However, there was an increase in sales in the iron steel and metallurgy sector by 10 million tons compared to last year. The average benchmark coal price in 2023 reached 201.15 USD/ton.

5. Crude Oil and Products

Crude oil production has continued to decline year by year, with production recorded at 605 MBOPD or 221 million barrels in 2023. Meanwhile, crude oil exports amounted to 21.3 million barrels and imports 132.4 million barrels, up 38% and 26% respectively from the previous year. The crude oil refinery input was 331.1 million barrels, including condensate, and fuel production at refineries was recorded at 273.1 million barrels. The average Indonesian Crude Price (ICP) in 2023 was 78.43 USD/barrel.





Domestic fuel sales in 2023 were the highest since 2013, with sales reaching 80.4 million KL. The highest sales for fuel products were Biogasoil at 35.7 million KL, followed by Gasoline RON 90 at 30.2 million KL. Exports of refined fuel products in 2023 reached 14.2 million barrels, and fuel imports were 26.8 million KL.

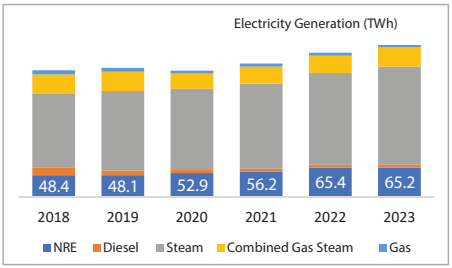
LPG production decreased by 0.6% in 2023, with a volume of 1.9 million tons, while exports were 209 tons and imports were 6.9 million tons. Domestic sales in 2023 were recorded at 8.7 million tons.

6. Natural Gas and Products

Unlike crude oil, natural gas production increased in 2023 with a production volume of 6,630 MMSCFD or 2.42 BSCF, while production in 2022 was 6,492 MMSCFD or 2.37 BSCF. Pipeline gas exports in 2023 amounted to 181 BSCF, a decrease from last year's 219 BSCF. In 2023, LNG production reached 847 BBTU and LNG exports reached 473 BBTU, each increasing by 7.4% and 9% from the previous year.

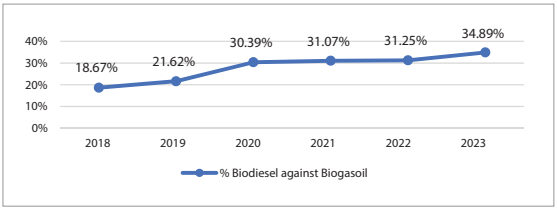
7. Electricity

Installed capacity of power plants in 2023 amounted to 91.2 GW with the highest peak electricity load in 2023 being 58.3 GW. The capacity of NRE-based power plants reached 13.3 GW or 14.58% of the total capacity.



Electricity production in 2023 was 350.6 TWh with NRE-based power plants producing 65.23 TWh, accounting for 18.60% of the total national production. Electricity sales in 2023 amounted to 288.4 TWh, a 5.4% increase from the previous year's 273.8 TWh. The highest electricity sales were to the household consumer group at 122.3 TWh followed by 88.5 TWh to the industrial sector. Transmission & Distribution Losses realization in 2023 was 8.63%.

8. New and Renewable Energy



Looking at the utilization of renewable energy, the production of biodiesel in 2023 reached 13.2 million KL, an increase of 11% compared to the previous year. Export realization amounted to 0.18 million KL, while domestic consumption reached 12.3 million KL. When compared to the domestic sales of Biogasoil products, the blending of biodiesel in Biogasoil reached 34.9%. In 2023, biomass utilization in the industrial sector was 7.9 million tons, and communal biogas utilization in the household sector reached 110 million m^3. Furthermore, in 2023, the utilization of solar water heaters amounted to 261 thousand TOE of hot water, along with direct use of geothermal heat in the industrial sector, which amounted to 6.2 Thermal MWh.

01
ENERGY & ECONOMIC INDICATORS

1.1 GDP and Energy Indicator

	Unit	2013	2014	2015	2016		2017	2018	2019	2020	2021	2022	2023
GDP at 2010 Constant Price[1)]	Trillion Rupiahs	8,156	8,565	8,983	9,435		9,913	10,426	10,949	10,723	11,120	11,710	12,301
GDP Nominal[1)]	Trillion Rupiahs	9,546	10,570	11,526	12,407		13,590	14,839	15,833	15,438	16,977	19,588	20,892
GDP Nominal per Capita[1)]	Thousand Rupiahs	38,366	41,916	45,120	47,957		51,891	55,992	59,060	56,953	62,258	71,030	74,965
Population[1)]	Thousand	248,818	252,165	255,462	258,705		261,891	265,015	268,075	271,066	272,683	275,774	278,696
Number of Households[1)]	Thousand	63,938	64,767	65,582	66,385		67,173	67,945	68,701	69,439	70,048	70,842	71,592
Primary Energy Supply	Thousand BOE	1,217,690	1,233,394	1,211,461	1,284,528		1,328,761	1,462,199	1,554,746	1,487,567	1,536,951	1,825,003	1,853,281
Primary Energy Supply per Capita	BOE / capita	4.89	4.89	4.74	4.97		5.07	5.52	5.80	5.49	5.64	6.62	6.65
Final Energy Consumption	Thousand BOE	748,096	760,490	760,401	754,023		791,145	889,295	963,059	851,151	871,441	1,148,486	1,220,778
Final Energy Consumption per Capita	BOE / capita	3.01	3.02	2.98	2.91		3.02	3.36	3.59	3.14	3.20	4.16	4.38

	Growth (%)					Growth (%)					
	2013-2014	2014-2015	2015-2016	2016-2017		2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023
GDP at 2010 Constant Price[1)]	5.01	4.88	5.03	5.07		5.17	5.02	-2.06	3.70	5.31	5.05
GDP Nominal[1)]	10.72	9.05	7.64	9.54		9.19	6.70	-2.49	9.97	15.38	6.66
GDP Nominal per Capita[1)]	9.25	7.64	6.29	8.20		7.90	5.48	-3.57	9.32	14.09	5.54
Population[1)]	1.35	1.31	1.27	1.23		1.19	1.15	1.12	0.60	1.13	1.06
Number of Households[1)]	1.30	1.26	1.22	1.19		1.15	1.11	1.07	0.88	1.13	1.06
Primary Energy Supply	1.29	-1.78	6.03	3.44		10.04	6.33	-4.32	3.32	18.74	1.55
Final Energy Consumption	1.66	-0.01	-0.84	4.92		12.41	8.29	-11.62	2.38	31.79	6.29
Final Energy Consumption per Capita	0.31	-1.30	-2.08	3.65		11.08	7.06	-12.60	1.78	30.31	5.18

Sources : 1) BPS, Statistics Indonesia
Note : Primary Energy Supply and Final Energy Consumption which are calculated is commercial energy (excluded Traditional Biomass)

1.2 Macro Economic

Year	GDP at 2010 Constant Prices					GDP at 2010 Constant Prices			GDP Nominal (Current Prices)	Index GDP Deflator
	GDP	Private Consumption	Government Consumption	Fixed Capital Formation		Stock Change	Export of Goods and Services	Import of Goods and Services		
	Billion Rupiahs	Billion Rupiahs	Billion Rupiahs	Billion Rupiahs		Billion Rupiahs	Billion Rupiahs	Billion Rupiahs	Billion Rupiahs	
2013	8,156,498	4,423,417	727,812	2,654,375		124,454	2,026,114	1,945,867	9,546,134	117
2014	8,564,867	4,651,018	736,283	2,772,471		163,583	2,047,887	1,987,114	10,569,705	123
2015	8,982,517	4,881,631	775,427	2,911,356		112,848	2,004,467	1,862,939	11,526,333	128
2016	9,434,632	5,126,028	774,298	3,041,587		133,400	1,973,040	1,817,369	12,406,774	132
2017	9,912,928	5,379,629	790,756	3,228,763		126,884	2,146,565	1,964,819	13,589,826	137
2018	10,425,852	5,651,456	828,877	3,444,310		197,370	2,286,395	2,203,270	14,838,756	142
2019	10,949,038	5,936,399	855,931	3,597,664		129,954	2,266,679	2,040,354	15,832,535	145
2020	10,723,055	5,780,223	872,774	3,419,182		51,334	2,090,273	1,704,165	15,438,018	144
2021	11,120,060	5,896,662	911,320	3,549,219		62,709	2,458,849	2,105,117	16,976,751	153
2022	11,710,248	6,187,944	870,558	3,686,574		70,749	2,858,016	2,420,794	19,588,090	167
2023	12,301,394	6,486,254	896,196	3,848,716		127,672	2,895,835	2,380,949	20,892,377	170

1.3 Price Index

Year	Wholesale Price Index[1)]			Consumer Price Index[2)]	Coal Price Index for Power Plant[3)]
	Export	Import	General		
2013	145.16	134.43	128.76	146.84	191.84
2014	138.73	137.37	132.44	111.53	205.32
2015	130.47	134.19	138.26	122.99	135.41
2016	133.31	128.10	149.16	126.71	124.94
2017	144.69	135.00	156.09	131.28	159.97
2018	162.29	147.35	164.60	135.39	156.79
2019	159.72	150.00	166.22	139.07	156.70
2020	150.75	150.91	103.55	105.68	187.47
2021	174.14	169.58	106.20	107.66	168.26
2022	193.43	186.46	111.23	113.59	186.62
2023	184.66	176.66	115.91	116.56	207.67

Source : BPS, Statistics Indonesia
Note : 1) Starting 2009 Wholesale Price Index using 2005 as base year (2005=100),
Starting November 2013 using 2010 as base year (2010=100)
2) Since June 2008, CPI has been based on a consumption pattern obtained from 2007 Cost of Living Survey in 66 cities (2007=100)
Since January 2014, CPI has been based on a consumption pattern obtained from 2012 Cost of Living Survey in 82 cities (2012=100)
3) The unit is (Rp/ton); unaudited data for 2023

1.4 Population and Employment

Year	Population	Labor Force	Household	Unemployment	Unemployment Percentage (toward labor force)
	Thousand People	Thousand People	Thousand Household	Thousand People	(%)
2013	248,818	118,193	63,938	7,389	6.3
2014	252,165	121,873	64,767	7,245	5.9
2015	255,462	114,819	65,582	7,561	6.6
2016	258,705	118,412	66,385	7,032	5.9
2017	261,891	121,022	67,173	7,040	5.8
2018	265,015	126,282	67,945	7,073	5.6
2019	268,075	128,755	68,701	7,104	5.5
2020	271,066	128,454	69,439	9,768	7.6
2021	272,683	131,051	70,048	9,102	6.9
2022	275,774	135,297	70,842	8,426	6.2
2023	278,696	139,852	71,592	7,855	5.6

Source : BPS, Statistics Indonesia

1.5 International Trade

Year	Balance of Trade[1]		Balance of Payment[2]		Balance of Payment[2]		Exchange Rate Rupiah to US$[2]	US$ Deflator[3]
	Export	Import	Current Account		Capital and Financial Account	Overall Balance		
	Million US$		Million US$		Million US$			
2013	197,060	200,548	-29,115		22,010	-7,105	12,189	1.07
2014	175,981	178,179	-4,159		5,087	928	12,440	1.09
2015	150,366	142,695	-17,519		16,860	-659	13,795	1.10
2016	145,186	135,653	-16,952		29,346	12,394	13,436	1.11
2017	168,828	156,986	-16,196		28,732	12,536	13,548	1.08
2018	180,215	188,711	-30,633		25,219	-5,414	14,038	1.10
2019	167,683	171,276	-30,279		36,603	6,324	13,901	1.12
2020	163,306	141,569	-4,433		7,921	3,488	14,105	1.14
2021	231,522	196,190	3,511		12,572	16,083	14,269	1.18
2022	291,979	237,447	3,499		605	4,104	15,731	1.27
2023	258,797	221,886	-1,567		8,783	7,179	15,416	1.31

Source : 1. BPS, Statistics Indonesia
2. Bank of Indonesia
3. Derived from World Economic Outlook Database, IMF

1.6 Share of Supply of Primary Energy

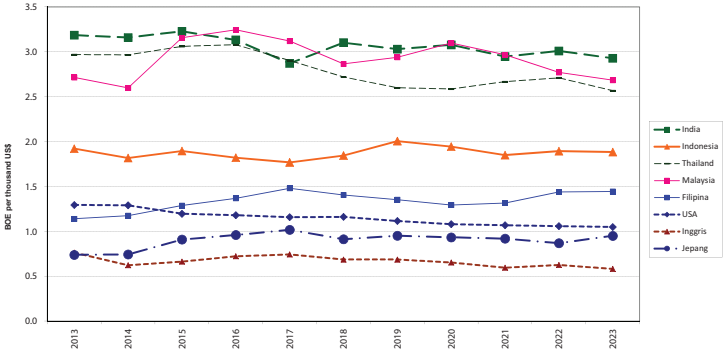
By Type (excluded Traditional Biomass)

(%)

Type of Energy	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Oil	48.26	46.84	42.06	41.43	41.63	38.79	35.05	31.66	32.10	30.39	29.91
Coal	24.86	25.94	30.10	29.61	30.67	33.06	37.39	37.24	36.36	40.86	39.69
Gas	22.18	22.00	22.93	22.28	20.99	19.51	18.31	20.16	19.71	16.89	17.11
New and Renewable Energy	4.97	5.36	4.92	6.69	6.71	8.64	9.25	10.94	11.83	11.86	13.29
Hydropower	3.16	3.08	2.86	3.69	3.58	2.75	2.53	3.04	2.99	2.78	2.46
Geothermal	1.25	1.31	1.35	1.37	1.52	1.78	1.68	1.94	1.92	1.70	1.70
Solar	n.a	n.a	n.a	n.a	n.a	0.02	0.03	0.05	0.05	0.09	0.16
Wind	n.a	n.a	n.a	n.a	n.a	0.03	0.08	0.08	0.07	0.05	0.06
Other Renewables	n.a	n.a	n.a	n.a	n.a	2.09	1.92	2.04	2.43	2.85	3.12
Solar-powered street lighting and solar powered energy saving lamp	n.a	n.a	n.a	n.a	n.a	0.00	0.00	0.00	0.00	0.00	0.00
Biofuel	0.56	0.97	0.69	1.61	1.58	1.94	2.95	3.73	4.27	4.08	4.54
BioGas	n.a	n.a	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.04
Industrial Biomass	n.a	n.a	0.01	0.01	0.01	0.02	0.04	0.04	0.09	0.25	1.10
Solar Water Heater	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	0.05	0.10
Direct Use of Geothermal	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	0.00	0.00

Note : Oil including crude oil, petroleum product and LPG
Coal including coal and briquette
Gas including natural gas and LNG
Solar PP including solar photovoltaic (PV), Solar-powered street lighting and solar-powered energy saving lamp
Other renewables is based on Bioenergy Based Power Plant
Biofuel : liquid biofuel (biodiesel)

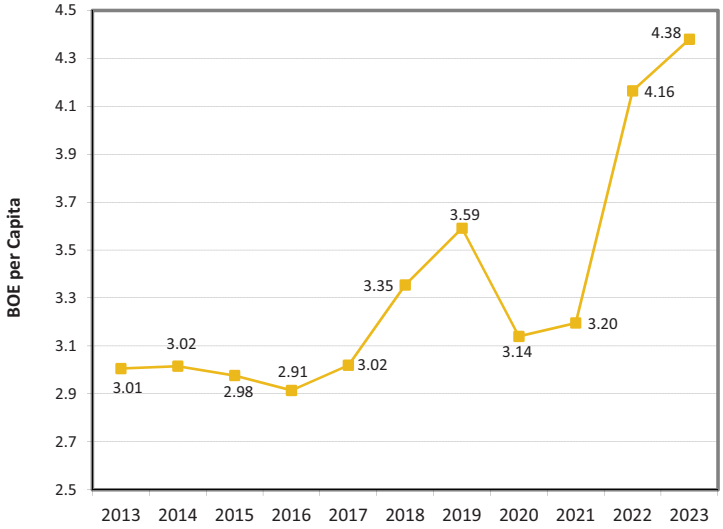
1.7. Comparison of Primary Energy Intensity in Some Country



Sources : BP Statistical Review of World Energy 2023 and World Economic Outlook Database, IMF

Note : GDP Primary Energy Consumption using US$ fix rate in year 2000; estimation data for 2023

1.8. Intensity of Final Energy Consumption per Capita



02
ENERGY BALANCE TABLE

Indonesia Energy Balance Table 2023

(Thousand BOE)

		Hydro Power	Geother-mal	Solar PP +Solar PV	Wind PP	Other Renew-ables	Public Street Lighting & LTSHE	Industrial Biomass	Solar Water Heater	Direct Use of Geo-thermal		Traditional Biomass	Coal	Briquette	Natural Gas	Crude Oil	Oil Fuel	Biofuel	BioGas	LPG	Electricity	LNG	Total
1	**Primary Energy Supply**	**45,677**	**31,459**	**3,033**	**1,180**	**57,739**	**43**	**20,452**	**1,915**	**4**		**16,649**	**735,543**	**0**	**402,127**	**337,659**	**159,316**	**84,096**	**702**	**57,416**	**0**	**-85,081**	**1,869,930**
	a. Production	45,677	31,459	3,033	1,180	57,739	43	20,452	1,915	4		16,649	2,678,563	0	434,643	221,089	0	85,315	702	0	0	0	3,598,462
	b. Import	0	0	0	0	0	0	0	0	0		0	49,957	0	0	132,386	159,132	0	0	59,252	0	0	400,727
	c. Export	0	0	0	0	0	0	0	0	0		0	-1,790,056	0	-32,515	-21,396	-15,714	-1,218	0	-2	0	-85,081	-1,945,981
	d. Stock Change	0	0	0	0	0	0	0	0	0		0	-202,922	0	0	5,580	15,897	0	0	-1,834	0	0	-183,278
2	**Energy Transformation**	**-45,677**	**-31,459**	**-3,033**	**-1,180**	**-57,739**	**-43**	**0**	**0**	**0**		**0**	**-418,788**	**3**	**-189,809**	**-331,038**	**333,777**	**-79,724**	**0**	**16,838**	**214,923**	**91,585**	**-501,364**
	a. Refinery	0	0	0	0	0	0	0	0	0		0	0	0	-6,466	-331,038	273,191	0	0	8,168	0	0	-56,146
	b. Gas Processing	0	0	0	0	0	0	0	0	0		0	0	0	-130,542	0	0	0	0	8,670	0	152,281	30,409
	c. LNG Regas	0	0	0	0	0	0	0	0	0		0	0	0	37,252	0	0	0	0	0	0	-37,252	0
	d. Coal Processing Plant	0	0	0	0	0	0	0	0	0		0	-3	3	0	0	0	0	0	0	0	0	0
	e. Biofuel Blending	0	0	0	0	0	0	0	0	0		0	0	0	0	0	79,724	-79,724	0	0	0	0	0
	f. Power Plant	-45,677	-31,459	-3,033	-1,180	-57,739	-43	0	0	0		0	-418,785	0	-90,054	0	-19,137	0	0	0	214,923	-23,444	-475,627
	- State Own Utility (PLN)	-19,793	-8,007	-61	0	-2,556	0	0	0	0		0	-239,193	0	-74,900	0	-19,124	0	0	0	112,780	-23,444	-274,297
	- Independent Power Producer (Non-PLN)	-17,232	-23,452	-778	-1,174	-1,011	0	0	0	0		0	-179,592	0	-15,154	0	-13	0	0	0	85,415	0	-152,992
	- Off Grid	0	0	-2,194	-5	-54,173	-43	0	0	0		0	0	0	0	0	0	0	0	0	13,873	0	-42,542
	- IO	-8,652	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	2,855	0	-5,797
3	**Own Use and Losses**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		**0**	**0**	**0**	**-44,564**	**-6,621**	**-933**	**0**	**0**	**0**	**-23,875**	**-6,504**	**-82,498**
	a. During Transformation	0	0	0	0	0	0	0	0	0		0	0	0	-6,466	-6,621	0	0	0	0	-7,414	0	-20,500
	b. Energy Use/ Own Use	0	0	0	0	0	0	0	0	0		0	0	0	-38,098	0	0	0	0	0	0	0	-38,098
	c. Transmission & Distribution	0	0	0	0	0	0	0	0	0		0	0	0	0	0	-933	0	0	0	-16,461	-6,504	-23,899
4	**Final Energy Supply**	**0**	**0**	**0**	**0**	**0**	**0**	**20,452**	**1,915**	**4**		**16,649**	**316,754**	**3**	**167,754**	**0**	**492,160**	**4,373**	**702**	**74,254**	**191,048**	**0**	**1,286,068**
5	**Statistic Discrepancy**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		**0**	**0**	**0**	**15,191**	**0**	**0**	**4,373**	**0**	**0**	**-2,491**	**0**	**17,073**
6	**Final Consumption**	**0**	**0**	**0**	**0**	**0**	**0**	**20,452**	**1,915**	**4**		**16,649**	**316,754**	**3**	**152,562**	**0**	**492,160**	**0**	**702**	**74,254**	**193,539**	**0**	**1,268,995**
7	**Final Energy Consumption**	**0**	**0**	**0**	**0**	**0**	**0**	**20,452**	**1,915**	**4**		**16,649**	**316,754**	**3**	**120,994**	**0**	**492,160**	**0**	**702**	**74,254**	**193,539**	**0**	**1,237,427**
	a. Industry	0	0	0	0	0	0	20,452	0	4		0	316,754	3	119,192	0	28,453	0	0	1,076	70,704	0	556,639
	b. Transportation	0	0	0	0	0	0	0	0	0		0	0	0	383	0	447,916	0	0	0	235	0	448,535
	c. Household	0	0	0	0	0	0	0	0	0		15,355	0	0	1,053	0	2,553	0	702	71,206	75,291	0	166,161
	d. Commercial	0	0	0	0	0	0	0	1,915	0		1,294	0	0	365	0	2,618	0	0	1,972	47,309	0	55,473
	e. Other Sector	0	0	0	0	0	0	0	0	0		0	0	0	0	0	10,619	0	0	0	0	0	10,619
8	**Non Energy Use**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		**0**	**0**	**0**	**31,568**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**31,568**

Note : Biofuel consists of Biodiesel while Biosolar is included in the Fuel category
Other renewables is based on Bioenergy Based Power Plant

03
ENERGY SUPPLY AND DEMAND

3.1 Primary Energy Supply by Sources

(BOE)

Year	Coal	Crude Oil & Product	Natural Gas & Product	Hydro Power	Geo-thermal	Solar PP & Solar PV	Wind		Other renew-ables[1)]	Solar Powered Public Street Lighting & Energy Saving Lamp	Traditional Biomass[2)]	Biofuel	BioGas	Industrial Biomass	Solar Water Heater	Direct Use of Geo-thermal	Total
2013	302,694,000	587,652,963	266,803,549	38,495,952	15,245,038	n.a	n.a		n.a	n.a	50,975,302	6,798,481	n.a	n.a	n.a	n.a	1,268,665,285
2014	319,956,003	577,688,014	269,636,449	37,955,765	16,191,566	n.a	n.a		n.a	n.a	47,686,087	11,966,513	n.a	n.a	n.a	n.a	1,281,080,397
2015	364,619,216	509,485,005	277,793,372	34,604,474	16,337,878	n.a	n.a		n.a	n.a	40,096,791	8,380,587	120,162	120,200	n.a	n.a	1,251,557,683
2016	380,310,000	532,134,133	286,140,751	47,450,306	17,537,710	n.a	n.a		n.a	n.a	36,085,192	20,625,241	144,549	185,041	n.a	n.a	1,320,612,924
2017	407,526,000	553,121,237	278,963,982	47,599,892	20,259,621	n.a	n.a		n.a	n.a	29,332,604	20,947,287	157,140	185,810	n.a	n.a	1,358,093,574
2018	483,335,998	567,189,661	285,286,127	40,204,916	26,040,932	355,896	466,082		30,493,437	8,795	27,997,958	28,312,237	162,745	341,891	n.a	n.a	1,490,196,675
2019	581,356,407	545,007,702	284,645,039	39,329,376	26,193,174	461,856	1,185,873		29,906,203	12,217	24,428,202	45,927,085	166,591	554,868	n.a	n.a	1,579,174,592
2020	553,923,901	471,002,427	299,926,865	45,206,315	28,909,243	704,140	1,164,203		30,386,506	13,284	21,992,044	55,515,900	176,604	637,393	n.a	n.a	1,509,558,826
2021	558,782,122	493,428,112	302,911,101	45,947,523	29,532,560	788,979	1,070,935		37,420,528	13,336	21,049,554	65,566,941	179,989	1,308,665	n.a	n.a	1,558,000,344
2022	745,721,066	554,614,889	308,152,429	50,781,201	30,978,688	1,705,507	872,631		52,086,071	50,462	18,652,939	74,370,840	206,181	4,523,519	935,639	3,645	1,843,655,706
2023	735,542,521	554,391,240	317,046,736	45,676,673	31,459,399	3,032,918	1,179,535		57,739,030	43,076	16,648,879	84,096,248	702,408	20,451,942	1,915,256	3,645	1,869,929,504

Note: Changes in Biofuel Assumptions as Biodiesel (pure)
1) Other renewables is based on Bioenergy Based Power Plant
2) Estimation data

3.2 Final Energy Consumption by Sector

3.2.1 Energy Consumption (included Traditional Biomass)

(BOE)

Sector	2013	2014	2015	2016	2017		2018	2019	2020	2021	2022	2023
Industrial	238,075,202	243,692,389	244,512,635	237,806,922	248,751,489		308,101,365	363,534,776	297,942,171	286,850,949	511,714,610	556,638,954
Households	149,131,592	152,589,661	149,138,103	149,435,602	148,201,551		151,970,684	153,780,287	158,357,450	162,295,494	162,192,816	166,160,880
Commercial	39,236,140	40,249,580	39,286,992	41,369,026	42,378,126		43,602,238	45,544,675	42,204,476	43,947,608	49,702,334	55,473,052
Transportation	341,435,096	342,824,309	345,573,159	341,273,971	364,147,055		400,041,524	413,515,119	364,394,195	388,608,604	432,588,457	448,534,653
Other	31,105,254	28,694,657	21,704,642	19,864,507	16,999,541		13,577,545	11,112,694	10,244,770	10,788,136	10,940,255	10,619,084
Final Energy Consumption	798,983,284	808,050,596	800,215,531	789,750,028	820,477,763		917,293,355	987,487,552	873,143,062	892,490,790	1,167,138,473	1,237,426,624
Non Energy Utilization	28,369,578	28,468,567	33,439,816	32,018,205	31,664,717		33,343,270	34,079,951	31,701,587	31,294,103	31,591,456	31,568,053

3.2.2 Energy Consumption (excluded Traditional Biomass)

(BOE)

Sector	2013	2014	2015	2016	2017		2018	2019	2020	2021	2022	2023
Industrial	238,075,202	243,692,389	244,512,635	237,806,922	248,751,489		308,101,365	363,534,776	297,942,171	286,850,949	511,714,610	556,638,954
Households	99,604,280	106,382,583	110,670,381	115,048,163	120,201,953		125,299,067	130,671,794	137,678,517	142,552,485	144,839,890	150,805,514
Commercial	37,876,138	38,896,378	37,940,555	40,029,321	41,045,120		42,275,897	44,224,966	40,891,366	42,641,063	48,402,322	54,179,540
Transportation	341,435,096	342,824,309	345,573,159	341,273,971	364,147,055		400,041,524	413,515,119	364,394,195	388,608,604	432,588,457	448,534,653
Other	31,105,254	28,694,657	21,704,642	19,864,507	16,999,541		13,577,545	11,112,694	10,244,770	10,788,136	10,940,255	10,619,084
Final Energy Consumption	748,095,970	760,490,316	760,401,372	754,022,884	791,145,159		889,295,397	963,059,350	851,151,018	871,441,236	1,148,485,534	1,220,777,745
Non Energy Utilization	28,369,578	28,468,567	33,439,816	32,018,205	31,664,717		33,343,270	34,079,951	31,701,587	31,294,103	31,591,456	31,568,053

Note: Final Energy Consumptions is exclude Non Energy Utilization

3.3 Final Energy Consumption by Type

(Thousand BOE)

Year	Tradi-tional Biomass	Industrial Biomass	Solar Water Heater	Direct Use of Geo-thermal	Coal[1)]	Natural Gas	Oil Fuel		BioGasoil[2)]			BioGas	Bri-quette	LPG	Electricity	Total
									Gasoil	Biodiesel	Blending Product					
2013	50,887	n.a	n.a	n.a	42,729	97,400	378,049		60,226	6,798	67,025	n.a	130	47,801	114,962	798,983
2014	47,560	n.a	n.a	n.a	55,064	95,103	363,713		60,901	11,967	72,868	n.a	58	51,942	121,743	808,051
2015	39,814	120	n.a	n.a	70,228	96,012	323,331		85,895	5,939	91,834	120	50	54,361	124,344	800,216
2016	35,727	185	n.a	n.a	63,504	93,192	329,094		59,244	19,516	78,760	145	107	56,626	132,411	789,750
2017	29,333	186	n.a	n.a	58,800	108,479	331,454		77,200	16,682	93,882	157	107	61,299	136,781	820,478
2018	27,998	342	n.a	n.a	100,506	118,720	320,730		105,949	24,327	130,276	163	36	64,471	154,052	917,293
2019	24,428	555	n.a	n.a	167,412	114,112	261,971		150,395	41,494	191,889	167	28	66,304	160,621	987,488
2020	21,992	637	n.a	n.a	113,416	106,970	222,339		124,806	54,494	179,300	177	188	68,400	159,725	873,143
2021	21,050	1,309	n.a	n.a	87,820	110,932	235,941		133,767	60,292	194,059	180	0	71,253	169,948	892,491
2022	18,653	4,524	936	4	299,191	107,321	262,987		149,134	67,784	216,918	206	0	72,988	183,412	1,167,138
2023	16,649	20,452	1,915	4	316,754	120,994	263,690		148,746	79,724	228,470	702	3	74,254	193,539	1,237,427

Note: Final Energy Consumptions is exclude Non Energy Utilization

1) There is an increase of smelter commissioning in 2018 and optimum operation of smelter in 2019
2) BioGasoil consumption is blending product of biodiesel

3.4 Share of Final Energy Consumption by Sector

(%)

Year	Industry	Household	Commer-cial	Transpor-tation	Other
2013	31.82	13.31	5.06	45.64	4.16
2014	32.04	13.99	5.11	45.08	3.77
2015	32.16	14.55	4.99	45.45	2.85
2016	31.54	15.26	5.31	45.26	2.63
2017	31.44	15.19	5.19	46.03	2.15
2018	34.65	14.09	4.75	44.98	1.53
2019	37.75	13.57	4.59	42.94	1.15
2020	35.00	16.18	4.80	42.81	1.20
2021	32.92	16.36	4.89	44.59	1.24
2022	44.56	12.61	4.21	37.67	0.95
2023	45.60	12.35	4.44	36.74	0.87

Note: Commercial Energy (excluded traditional biomass)

3.5 Share of Final Energy Consumption by Type

(%)

Year	Industrial Biomass	Solar Water Heater	Direct Use of Geo-thermal	Coal[1)]	Natural Gas	Oil Fuel
2013	0,00	0,00	0,00	5.73	13.02	50.53
2014	0,00	0,00	0,00	7.25	12.51	47.83
2015	0.02	0,00	0,00	9.24	12.63	42.52
2016	0.02	0,00	0,00	8.44	12.36	43.65
2017	0.02	0,00	0,00	7.45	13.71	41.90
2018	0.04	0,00	0,00	11.31	13.35	36.07
2019	0.06	0,00	0,00	17.39	11.85	27.20
2020	0.07	0,00	0,00	13.35	12.57	26.12
2021	0.15	0,00	0,00	10.08	12.73	27.07
2022	0.39	0.08	0.00	26.05	9.34	22.90
2023	1.68	0.16	0.00	25.95	9.91	21.60

Note: exclude Traditional Biomass

1) Coal is including Briquette
2) BioGasoil consumption is blending product of biodiesel; Gasoil is processed data; source of biodiesel is from Directorate General of New and Renewable Energy and Energy Conservation

3.5 Share of Final Energy Consumption by Type (continued)

(%)

Year	BioGasoil[2)]			BioGas	LPG	Electricity
	Gasoil	Biodiesel	Blending Product			
2013	8.86	0.10	8.96	0,00	6.39	15.37
2014	9.42	0.16	9.58	0,00	6.83	16.01
2015	12.01	0.06	12.08	0.02	7.15	16.35
2016	10.20	0.25	10.45	0.02	7.51	17.56
2017	11.69	0.18	11.87	0.02	7.75	17.29
2018	14.46	0.19	14.65	0.02	7.25	17.32
2019	19.71	0.22	19.92	0.02	6.88	16.68
2020	20.76	0.30	21.07	0.02	8.04	18.77
2021	21.96	0.31	22.27	0.02	8.18	19.50
2022	18.57	0.31	18.89	0.02	6.36	15.97
2023	18.37	0.35	18.72	0.06	6.08	15.85

Note: exclude Traditional Biomass
1) Coal is including Briquette
2) BioGasoil consumption is blending product of biodiesel; Gasoil is processed data; source of biodiesel is from Directorate General of New and Renewable Energy and Energy Conservation

04
ENERGY PRICES

4.1 Crude Oil Price

(US$ per Barrel)

Crude Oil Type	2013	2014	2015	2016	2017		2018	2019	2020	2021	2022	2023
SLC	108.15	98.63	49.39	40.98	51.98		68.20	63.10	41.98	68.94	99.18	81.16
Arjuna	104.23	94.82	48.54	39.35	51.20		67.65	63.42	39.24	68.15	98.38	79.05
Attaka	107.57	97.96	51.20	41.82	52.86		69.78	65.14	40.07	69.45	99.27	80.05
Cinta	106.51	96.83	48.22	40.00	50.59		66.65	61.79	40.27	66.81	97.47	79.45
Duri	104.44	94.67	47.60	37.63	49.47		65.76	64.75	48.69	73.84	107.15	86.47
Widuri	106.05	97.03	48.44	40.13	50.76		66.82	61.99	40.82	67.75	98.02	80.00
Belida	109.69	99.63	52.62	43.15	53.33		70.25	64.87	39.89	69.64	99.42	80.09
Senipah Condensate	106.48	98.25	52.92	43.44	53.31		69.57	59.89	39.35	69.90	91.70	71.44
Average [1)]	105.85	96.51	49.21	40.13	51.19		67.47	62.37	40.39	68.47	97.03	78.43

Sources : Oil and Gas Statistics - Directorate General of Oil and Gas
Note : 1) Arithmatic Average Indonesian Crude Oil Price from 57 type of crude

4.2 International Gas Price

(US$/MMBTU)

Year	LNG	Natural Gas			
	CIF on Japan[1)]	Average German Import Price[2)]	UK (Heren NBP Index)[3)]	USA (Henry Hub)[4)]	Canada (Alberta)[5)]
2013	16.17	10.72	10.63	3.71	2.93
2014	16.33	9.11	8.22	4.35	3.87
2015	10.31	6.61	6.53	2.60	2.01
2016	6.94	4.93	4.69	2.46	1.55
2017	8.10	5.62	5.80	2.96	1.60
2018	10.05	6.62	8.06	3.13	1.12
2019	9.94	5.25	4.47	2.53	1.27
2020	7.81	4.06	3.42	1.99	1.58
2021	10.07	8.94	15.80	3.84	2.75
2022	18.43	24.17	25.10	6.45	5.81
2023	14.38	12.88	10.04	2.53	2.24

Source : BP Statistical Review of World Energy, 2023
Note : 1) in 2023, based on statista.com
2) in 2023, based on www.ycharts.com/indicators/germany_natural_gas_border_price
3) in 2023, based on www.tradingeconomics.com/commodity/uk-natural-gas
4) in 2023, based on www.eia.gov/dnav/ng
5) in 2023, based on www.gasalberta.com/gas-market/gas-rates-in-alberta

4.3 Average Price of LNG, and Coal FOB Export

Year	LNG[1)]	Coal[2)]
	US$/MMBTU	US$/Ton
2013	9.63	82.92
2014	9.50	72.62
2015	6.57	60.13
2016	3.80	61.84
2017	5.50	85.92
2018	6.64	98.96
2019	4.58	77.89
2020	3.32	58.17
2021	4.15	121.47
2022	11.17	276.58
2023	10.48	201.15

Source : 1) Bank Indonesia
2) Directorate General of Mineral and Coal, using Arithmatic average of Indonesian Coal Price Reference

4.4 Energy Price per Energy Unit[1)]

Year	Gasoline[2)] (Ron 90)		Gasoline (Ron 92)		Avtur		Kerosene			Gasoil CN 48		Gasoil CN 51		LPG (3 Kg)		LPG (12 Kg)		LPG (50 Kg)	
	Thousand Rp/BOE	US$/ BOE	Thousand Rp/BOE	US$/ BOE	Thousand Rp/BOE	US$/ BOE	Thousand Rp/BOE	US$/ BOE		Thousand Rp/BOE	US$/ BOE	Thousand Rp/BOE	US$/ BOE	Thousand Rp/BOE	US$/ BOE	Thousand Rp/BOE	US$/ BOE	Thousand Rp/BOE	US$/ BOE
2013	954	78	1,678	185	1,694	139	422	35		775	64	1,721	190	499	41	747	61	1,569	129
2014	1,157	93	1,859	205	1,524	123	422	34		885	71	1,920	212	499	40	1,211	97	1,548	124
2015	1,238	90	1,517	167	1,562	113	422	31		1,052	76	1,673	184	499	36	1,440	104	1,428	104
2016	1,129	84	1,305	144	1,227	91	422	31		815	61	1,290	142	499	37	1,361	101	1,247	93
2017	1,110	82	1,463	161	1,418	105	422	31		794	59	1,318	145	499	37	1,410	104	1,461	108
2018	1,110	79	1,785	197	1,713	122	422	30		794	57	1,673	184	499	36	1,457	104	1,612	115
2019	1,110	80	1,690	186	1,664	120	422	30		794	57	1,804	199	499	36	1,457	105	1,330	96
2020	1,110	79	1,544	170	1,553	110	422	30		794	56	1,572	173	499	35	1,457	103	1,333	95
2021	1,110	78	1,544	170	2,136	150	422	30		794	56	1,719	190	499	35	1,867	131	2,238	157
2022	1,716	122	2,385	263	3,212	204	422	27		794	50	2,898	320	499	32	2,361	150	2,289	145
2023	1,716	120	2,291	253	2,856	185	422	27		794	51	2,497	275	499	32	2,361	153	2,261	147

Note : 1) At the official selling point
2) Gasoline RON 88 price before 2022

4.4 Energy Price per Energy Unit[1)] (continued)

Year	Coal		Electricity (Average)			Electricity (Average)			
			Household			Industry		Commercial	
	Thousand Rp/ BOE	US$/BOE	Thousand Rp/ BOE	US$/BOE		Thousand Rp/ BOE	US$/BOE	Thousand Rp/ BOE	US$/BOE
2013	219	18	1,129	93		1,299	107	1,822	149
2014	235	19	1,237	99		1,595	128	2,065	166
2015	155	11	1,365	99		1,864	135	2,095	152
2016	143	11	1,376	102		1,716	128	1,959	146
2017	183	14	1,723	127		1,776	131	2,032	150
2018	179	13	1,798	128		1,770	126	2,029	145
2019	179	13	1,793	129		1,796	129	2,053	148
2020	214	15	1,618	115		1,780	126	2,022	143
2021	192	13	1,670	117		1,772	124	2,014	141
2022	213	14	1,841	117		1,763	112	2,048	130
2023	238	15	1,886	122		1,762	114	2,057	133

Note : 1) At the official selling point

05
ENERGY DEMAND BY SECTORS

5.1.1 Energy Consumption in Industrial Sector

(in Original Unit)

Year	Industrial Biomass	Direct Use of Geo-thermal	Coal	Bri-quette	Gas	Oil Fuel		Oil Fuel					LPG	Electricity
						Kerosene		Gasoil CN 48	Bio Gasoil[1)]	MDF	Fuel Oil	Total Oil Fuel		
	Thousand Ton	Thermal GWh	Thousand Ton		MMSCF	Kilo Liter		Kilo Liter					Thousand Ton	GWh
2013	n.a	n.a	10,174	36	533,016	72,018		7,217,679	0	66,244	1,672,420	9,028,360	81	64,381
2014	n.a	n.a	13,110	16	519,533	55,503		6,525,236	0	50,953	1,596,283	8,227,975	88	65,909
2015	47	n.a	16,721	14	524,100	43,950		4,570,091	0	44,423	1,395,820	6,054,284	92	64,079
2016	72	n.a	15,120	30	509,570	34,211		4,262,333	0	35,294	1,696,881	6,028,718	96	68,145
2017	73	n.a	14,000	30	593,359	35,067		3,839,186	0	82,275	1,761,804	5,718,331	104	72,238
2018	133	n.a	23,930	10	649,539	34,265		2,854,407	0	59,633	1,892,499	4,840,804	110	93,537
2019	217	n.a	39,860	8	623,465	32,328		169,475	2,053,730	47,464	1,419,742	3,722,739	113	94,281
2020	249	n.a	27,004	53	587,375	30,032		315,726	1,918,990	35,415	1,101,693	3,401,856	116	89,133
2021	511	n.a	20,910	0	609,251	29,911		571,220	2,076,953	45,559	1,166,224	3,889,866	121	100,313
2022	1,765	6	86,587	0	587,393	28,798		229,938	2,321,611	53,407	2,119,067	4,752,821	124	113,565
2023	7,980	6	91,669	1	663,654	28,747		204,932	2,445,246	41,149	1,554,190	4,274,265	126	115,341

Note: 1) Based on Regulation of the Minister of Energy and Mineral Resources No. 12 year 2015 regarding to mandatory of minimum biodiesel utilization as blending product of gasoil by 30% in 2020

5.1.2 Energy Consumption in Industrial Sector

(in Energy Unit)

(Thousand BOE)

Year	Industrial Biomass	Direct Use of Geo-thermal	Coal	Briquette	Gas	Oil Fuel			Oil Fuel				LPG	Electricity	Total
						Kerosene	Gasoil CN 48		BioGasoil[1)]	MDF	Fuel Oil	Total Oil Fuel			
2013	n.a	n.a	42,729	130	95,730	427	46,822		0	438	11,642	59,328	693	39,466	238,075
2014	n.a	n.a	55,064	58	93,308	329	42,330		0	337	11,112	54,108	753	40,402	243,692
2015	120	n.a	70,228	50	94,128	261	29,647		0	294	9,717	39,917	788	39,281	244,513
2016	185	n.a	63,504	107	91,519	203	27,650		0	233	11,812	39,899	821	41,773	237,807
2017	186	n.a	58,800	107	106,567	208	24,905		0	544	12,264	37,921	888	44,282	248,751
2018	342	n.a	100,506	36	116,657	203	18,517		0	394	13,174	32,288	934	57,338	308,101
2019	555	n.a	167,412	28	111,974	192	1,099		13,323	314	9,883	24,811	961	57,794	363,535
2020	637	n.a	113,416	188	105,492	178	2,048		12,449	234	7,669	22,578	991	54,638	297,942
2021	1,309	n.a	87,820	0	109,421	177	3,706		13,473	301	8,118	25,776	1,033	61,492	286,851
2022	4,524	4	299,191	0	105,496	171	1,492		15,061	353	14,751	31,827	1,058	69,616	511,715
2023	20,452	4	316,754	3	119,192	170	1,329		15,863	272	10,819	28,453	1,076	70,704	556,639

Note: 1) Based on Regulation of the Minister of Energy and Mineral Resources No. 12 year 2015 regarding to mandatory of minimum biodiesel utilization as blending product of gasoil by 30% in 2020

5.1.3 Share of Energy Consumption in Industrial Sector

(%)

Year	Industrial Biomass	Direct Use of Geo-thermal	Coal	Briquette	Gas	Oil Fuel		Oil Fuel				LPG	Elec-tricity
						Kerosene		Gasoil CN 48	Bio-Gasoil[1)]	MDF	Fuel Oil		
2013	0.00	0.00	17.95	0.05	40.21	0.18		19.67	0.00	0.18	4.89	0.29	16.58
2014	0.00	0.00	22.60	0.02	38.29	0.14		17.37	0.00	0.14	4.56	0.31	16.58
2015	0.05	0.00	28.72	0.02	38.50	0.11		12.12	0.00	0.12	3.97	0.32	16.06
2016	0.08	0.00	26.70	0.04	38.48	0.09		11.63	0.00	0.10	4.97	0.35	17.57
2017	0.07	0.00	23.64	0.04	42.84	0.08		10.01	0.00	0.22	4.93	0.36	17.80
2018	0.11	0.00	32.62	0.01	37.86	0.07		6.01	0.00	0.13	4.28	0.30	18.61
2019	0.15	0.00	46.05	0.01	30.80	0.05		0.30	3.66	0.09	2.72	0.26	15.90
2020	0.21	0.00	38.07	0.06	35.41	0.06		0.69	4.18	0.08	2.57	0.33	18.34
2021	0.46	0.00	30.62	0.00	38.15	0.06		1.29	4.70	0.10	2.83	0.36	21.44
2022	0.88	0.00	58.47	0.00	20.62	0.03		0.29	2.94	0.07	2.88	0.21	13.60
2023	3.67	0.00	56.90	0.00	21.41	0.03		0.24	2.85	0.05	1.94	0.19	12.70

Note: Excluded Traditional Biomass

1) Based on Regulation of the Minister of Energy and Mineral Resources No. 12 year 2015 regarding to mandatory of minimum biodiesel utilization as blending product of gasoil by 30% in 2020

5.2.1 Energy Consumption in Household Sector
(in Original Unit)

Year	Traditional Biomass[1)]	Gas	Kerosene	LPG	BioGas	Electricity
	Thousand Ton	MMSCF	Kilo Liter	Thousand Ton	Thousand m^3	GWh
2013	21,553	215	1,079,100	5,377	n.a	77,211
2014	20,108	549	831,641	5,843	n.a	84,086
2015	16,740	861	658,537	6,115	18,953	88,682
2016	14,965	923	512,604	6,370	22,800	93,635
2017	12,185	1,363	525,429	6,896	24,786	94,457
2018	11,607	1,333	513,411	7,252	25,670	97,927
2019	10,056	2,238	484,392	7,459	26,277	103,833
2020	8,999	2,464	449,994	7,694	27,856	112,235
2021	8,592	3,073	448,180	8,015	28,390	115,556
2022	7,552	4,059	431,506	8,211	32,521	116,403
2023	6,682	5,862	430,745	8,353	110,792	122,824

Note: 1) Estimation data

5.2.2 Energy Consumption in Household Sector

(in Energy Unit)

(Thousand BOE)

Year	Tra-ditional Bio-mass[1)]	Gas	Kerosene	LPG	BioGas	Electricity	Total
2013	49,527	39	6,396	45,839	n.a	47,330	149,132
2014	46,207	99	4,929	49,810	n.a	51,545	152,590
2015	38,468	155	3,903	52,130	120	54,362	149,138
2016	34,387	166	3,038	54,302	145	57,398	149,436
2017	28,000	245	3,114	58,783	157	57,902	148,202
2018	26,672	239	3,043	61,824	163	60,029	151,971
2019	23,108	402	2,871	63,583	167	63,649	153,780
2020	20,679	442	2,667	65,592	177	68,800	158,357
2021	19,743	552	2,657	68,328	180	70,836	162,295
2022	17,353	729	2,558	69,992	206	71,355	162,193
2023	15,355	1,053	2,553	71,206	702	75,291	166,161

Note: 1) Estimation data

5.2.3 Share of Energy Consumption in Household Sector

(%)

Year	Gas	Kerosene	LPG	BioGas	Electricity
2013	0.04	6.42	46.02	0.00	47.52
2014	0.09	4.63	46.82	0.00	48.45
2015	0.14	3.53	47.10	0.11	49.12
2016	0.14	2.64	47.20	0.13	49.89
2017	0.20	2.59	48.90	0.13	48.17
2018	0.19	2.43	49.34	0.13	47.91
2019	0.31	2.20	48.66	0.13	48.71
2020	0.32	1.94	47.64	0.13	49.97
2021	0.39	1.87	47.93	0.13	49.69
2022	0.50	1.77	48.32	0.14	49.26
2023	0.70	1.69	47.22	0.47	49.93

5.3.1 Energy Consumption in Commercial Sector

(in Original Unit)

Year	Traditional Biomass[1]	Solar Water Heater	Gas	Oil Fuel					LPG	Electricity
				Kerosene	Gasoil CN 48	Bio-Gasoil[2]	MDF	Total Oil Fuel		
	Thousand Ton	Thousand TOE	MMSCF	Kilo Liter					Thousand Ton	GWh
2013	592	n.a	7,915	59,587	1,039,286	0	355	1,099,229	149	45,820
2014	589	n.a	8,057	45,923	939,580	0	273	985,777	162	48,452
2015	586	n.a	7,990	36,364	658,056	0	238	694,658	169	49,879
2016	583	n.a	7,084	28,306	613,741	0	189	642,236	176	54,002
2017	580	n.a	6,705	29,014	552,811	0	441	582,267	191	56,202
2018	577	n.a	6,745	28,350	411,011	0	320	439,681	201	59,570
2019	574	n.a	6,871	26,748	24,403	295,720	255	347,126	207	63,611
2020	571	n.a	4,076	24,848	45,462	276,319	190	346,819	213	58,902
2021	569	n.a	3,906	24,748	82,251	299,064	244	406,308	222	61,053
2022	566	128	4,297	23,828	33,109	334,293	287	391,516	227	68,891
2023	563	261	2,035	23,786	29,509	352,095	221	405,610	231	77,176

Note: 1) Estimation Data
2) Based on Regulation of the Minister of Energy and Mineral Resources No. 12 year 2015 regarding to mandatory of minimum biodiesel utilization as blending product of gasoil by 30% in 2020

5.3.2 Energy Consumption in Commercial Sector

(in Energy Unit)

(Thousand BOE)

Year	Tra-ditional Bio-mass[1)]	Solar Water Heater	Gas	Oil Fuel					LPG	Elec-tricity	Total
				Kero-sene	Gasoil CN 48	Bio-Gas-oil[2)]	MDF	Total Oil Fuel			
2013	1,360	n.a	1,422	353	6,742	0	2	7,098	1,269	28,088	39,236
2014	1,353	n.a	1,447	272	6,095	0	2	6,369	1,379	29,701	40,250
2015	1,346	n.a	1,435	216	4,269	0	2	4,486	1,444	30,576	39,287
2016	1,340	n.a	1,272	168	3,981	0	1	4,150	1,504	33,103	41,369
2017	1,333	n.a	1,204	172	3,586	0	3	3,761	1,628	34,452	42,378
2018	1,326	n.a	1,211	168	2,666	0	2	2,836	1,712	36,516	43,602
2019	1,320	n.a	1,234	159	158	1,918	2	2,237	1,761	38,993	45,545
2020	1,313	n.a	732	147	295	1,793	1	2,236	1,816	36,107	42,204
2021	1,307	n.a	701	147	534	1,940	2	2,622	1,892	37,426	43,948
2022	1,300	936	772	141	215	2,169	2	2,527	1,938	42,230	49,702
2023	1,294	1,915	365	141	191	2,284	1	2,618	1,972	47,309	55,473

Note: 1) Estimation Data
2) Based on Regulation of the Minister of Energy and Mineral Resources No. 12 year 2015 regarding to mandatory of minimum biodiesel utilization as blending product of gasoil by 30% in 2020

5.3.3 Share of Energy Consumption in Commercial Sector

(%)

Year	Solar Water Heater	Gas	Oil Fuel				LPG	Electricity
			Kero-sene	Gasoil CN 48	Bio-Gasoil[1)]	MDF		
2013	0.00	3.75	0.93	17.80	0.00	0.01	3.35	74.16
2014	0.00	3.72	0.70	15.67	0.00	0.00	3.55	76.36
2015	0.00	3.78	0.57	11.25	0.00	0.00	3.80	80.59
2016	0.00	3.18	0.42	9.95	0.00	0.00	3.76	82.70
2017	0.00	2.93	0.42	8.74	0.00	0.01	3.97	83.94
2018	0.00	2.87	0.40	6.31	0.00	0.01	4.05	86.38
2019	0.00	2.79	0.36	0.36	4.34	0.00	3.98	88.17
2020	0.00	1.79	0.36	0.72	4.38	0.00	4.44	88.30
2021	0.00	1.64	0.34	1.25	4.55	0.00	4.44	87.77
2022	1.93	1.59	0.29	0.44	4.48	0.00	4.00	87.25
2023	3.66	0.70	0.27	0.37	4.37	0.00	3.77	90.52

Note: 1) Based on Regulation of the Minister of Energy and Mineral Resources No. 12 year 2015 regarding to mandatory of minimum biodiesel utilization as blending product of gasoil by 30% in 2020

5.4.1 Energy Consumption in Transportation Sector

(in Original Unit)

Year	Gas	Oil Fuel															Electricity
		AvGas	Avtur	Gasoline RON 88	Gasoline RON 92	Gasoline RON 95+98+100	Gasoline RON 90	Gasoil CN 51	Gasoil CN 53	Kerosene	Gasoil CN 48	MDF	Fuel Oil	BioGasoil[1)]	Total Oil Fuel		
	MMSCF	Kilo Liter							Kilo Liter								GWh
2013	1,172	2,868	4,159,010	28,622,924	850,408	158,714	0	23,053	0	476	11,797,043	2,643	32,528	10,332,005	55,981,673		129
2014	1,388	1,499	4,229,094	28,822,039	1,062,920	154,888	0	33,305	0	367	10,665,269	2,033	31,048	11,232,729	56,235,192		155
2015	1,635	3,070	4,336,624	27,269,723	2,761,956	278,758	379,959	38,552	0	291	7,469,653	1,772	27,149	14,156,373	56,723,880		205
2016	1,310	3,172	4,875,486	21,033,867	4,780,929	366,168	5,805,228	105,889	136,311	226	6,966,634	1,408	33,004	12,141,027	56,249,349		223
2017	2,576	2,964	5,371,183	12,120,403	6,188,300	379,998	14,487,098	391,895	178,695	232	6,275,015	3,283	34,267	14,472,082	59,905,415		236
2018	3,410	3,808	5,717,729	10,434,089	5,643,055	385,977	17,706,790	666,191	199,901	227	4,665,428	2,379	36,809	20,082,381	65,544,765		274
2019	2,792	2,366	5,030,485	11,337,192	4,254,343	326,569	19,410,819	547,193	287,043	214	277,001	1,894	27,614	26,188,701	67,691,434		301
2020	1,686	1,453	2,774,198	8,383,244	4,056,945	353,168	18,143,189	507,151	268,111	199	516,042	1,413	21,428	24,470,536	59,497,078		292
2021	1,431	1,047	2,031,726	3,358,307	5,713,190	481,184	23,297,401	701,009	333,628	198	933,639	1,818	22,683	26,484,837	63,360,667		317
2022	1,807	1,409	3,320,023	6,115	5,776,110	320,353	29,697,521	1,024,064	374,782	190	375,826	2,131	41,216	29,604,664	70,544,404		344
2023	2,135	1,670	4,331,309	0	5,438,351	361,338	30,223,847	827,325	374,152	190	334,955	1,642	30,229	31,181,237	73,106,243		384

Note: 1) Based on Regulation of the Minister of Energy and Mineral Resources No. 12 year 2015 regarding to mandatory of minimum biodiesel utilization as blending product of gasoil by 30% in 2020

5.4.2 Energy Consumption in Transportation Sector

(in Energy Unit)

(Thousand BOE)

Year	Gas	Oil Fuel								Oil Fuel							Elec-tricity	Total
		AvGas	Avtur	Gasoline RON 88	Gasoline RON 92	Gasoline RON 95+98+100	Gasoline RON 90	Gasoil CN 51		Gasoil CN 53	Kero-sene	Gasoil CN 48	MDF	Fuel Oil	Bio-Gasoil[1)]	Total Oil Fuel		
2013	211	16	24,499	166,800	4,956	925	0	150		0	3	76,529	17	226	67,025	341,146	79	341,435
2014	249	8	24,912	167,960	6,194	903	0	216		0	2	69,187	13	216	72,868	342,480	95	342,824
2015	294	17	25,546	158,914	16,095	1,624	2,214	250		0	2	48,456	12	189	91,834	345,154	126	345,573
2016	235	18	28,720	122,575	27,861	2,134	33,830	687		884	1	45,193	9	230	78,760	340,902	137	341,274
2017	463	16	31,640	70,632	36,062	2,214	84,424	2,542		1,159	1	40,707	22	239	93,882	363,540	144	364,147
2018	612	21	33,681	60,805	32,885	2,249	103,186	4,322		1,297	1	30,265	16	256	130,276	399,261	168	400,042
2019	501	13	29,633	66,067	24,792	1,903	113,117	3,550		1,862	1	1,797	13	192	169,889	412,829	185	413,515
2020	303	8	16,342	48,853	23,642	2,058	105,729	3,290		1,739	1	3,348	9	149	158,743	363,912	179	364,394
2021	257	6	11,968	19,571	33,294	2,804	135,766	4,548		2,164	1	6,057	12	158	171,810	388,157	194	388,609
2022	324	8	19,557	36	33,660	1,867	173,062	6,643		2,431	1	2,438	14	287	192,048	432,053	211	432,588
2023	383	9	25,514	0	31,692	2,106	176,129	5,367		2,427	1	2,173	11	210	202,276	447,916	235	448,535

Note: 1) Based on Regulation of the Minister of Energy and Mineral Resources No. 12 year 2015 regarding to mandatory of minimum biodiesel utilization as blending product of gasoil by 30% in 2020

5.4.3 Share of Energy Consumption in Transportation Sector

(%)

Year	Gas	Oil Fuel						Oil Fuel								Elec-tricity
		AvGas	Avtur	Gasoline RON 88	Gasoline RON 92	Gasoline RON 95+98+100	Gasoline RON 90	Gasoil CN 51	Gasoil CN 53	Kero-sene	Gasoil CN 48	MDF	Fuel Oil	Bio-Gasoil[1)]	Total Oil Fuel	
2013	0.06	0.00	7.18	48.85	1.45	0.27	0.00	0.04	0.00	0.00	22.41	0.01	0.07	19.63	99.92	0.02
2014	0.07	0.00	7.27	48.99	1.81	0.26	0.00	0.06	0.00	0.00	20.18	0.00	0.06	21.26	99.90	0.03
2015	0.08	0.00	7.39	45.99	4.66	0.47	0.64	0.07	0.00	0.00	14.02	0.00	0.05	26.57	99.88	0.04
2016	0.07	0.01	8.42	35.92	8.16	0.63	9.91	0.20	0.26	0.00	13.24	0.00	0.07	23.08	99.89	0.04
2017	0.13	0.00	8.69	19.40	9.90	0.61	23.18	0.70	0.32	0.00	11.18	0.01	0.07	25.78	99.83	0.04
2018	0.15	0.01	8.42	15.20	8.22	0.56	25.79	1.08	0.32	0.00	7.57	0.00	0.06	32.57	99.80	0.04
2019	0.12	0.00	7.17	15.98	6.00	0.46	27.35	0.86	0.45	0.00	0.43	0.00	0.05	41.08	99.83	0.04
2020	0.08	0.00	4.48	13.41	6.49	0.56	29.02	0.90	0.48	0.00	0.92	0.00	0.04	43.56	99.87	0.05
2021	0.07	0.00	3.08	5.04	8.57	0.72	34.94	1.17	0.56	0.00	1.56	0.00	0.04	44.21	99.88	0.05
2022	0.08	0.00	4.52	0.01	7.78	0.43	40.01	1.54	0.56	0.00	0.56	0.00	0.07	44.40	99.88	0.05
2023	0.09	0.00	5.69	0.00	7.07	0.47	39.27	1.20	0.54	0.00	0.48	0.00	0.05	45.10	99.86	0.05

Note: 1) Based on Regulation of the Minister of Energy and Mineral Resources No. 12 year 2015 regarding to mandatory of minimum biodiesel utilization as blending product of gasoil by 30% in 2020

5.5.1 Energy Consumption in Others Sector

(in Original Unit)

(Kilo Liter)

Year	Mogas	Kero-sene	Gasoil CN 48	Bio-Gasoil[1)]	MDF	Fuel Oil	Total Oil Fuel
	Kilo Liter						
2013	878,849	49,308	3,661,709	0	9,894	268,954	4,868,714
2014	884,962	38,001	3,310,415	0	7,611	256,710	4,497,699
2015	837,299	30,091	2,318,521	0	6,635	224,472	3,417,019
2016	645,831	23,423	2,162,388	0	5,272	272,888	3,109,802
2017	372,149	24,009	1,947,715	0	12,289	283,329	2,639,491
2018	320,372	23,460	1,448,112	0	8,907	304,347	2,105,198
2019	348,101	22,134	85,979	1,041,908	7,089	228,319	1,733,531
2020	257,402	20,562	160,175	973,552	5,290	177,171	1,594,152
2021	103,115	20,479	289,794	1,053,690	6,805	187,549	1,661,432
2022	188	19,717	116,653	1,177,811	7,977	340,783	1,663,129
2023	0	19,682	103,967	1,240,535	6,146	249,941	1,620,271

Note: 1) Based on Regulation of the Minister of Energy and Mineral Resources No. 12 year 2015 regarding to mandatory of minimum biodiesel utilization as blending product of gasoil by 30% in 2020

5.5.2 Energy Consumption in Others Sector

(in Energy Unit)

(Thousand BOE)

Year	Mogas	Kero-sene	Gasoil CN 48	Bio-Gasoil[1)]	MDF	Fuel Oil	Total Oil Fuel
2013	5,121	292	23,754	0	65	1,872	31,105
2014	5,157	225	21,475	0	50	1,787	28,695
2015	4,879	178	15,040	0	44	1,563	21,705
2016	3,764	139	14,028	0	35	1,900	19,865
2017	2,169	142	12,635	0	81	1,972	17,000
2018	1,867	139	9,394	0	59	2,119	13,578
2019	2,029	131	558	6,759	47	1,589	11,113
2020	1,500	122	1,039	6,316	35	1,233	10,245
2021	601	121	1,880	6,835	45	1,306	10,788
2022	1	117	757	7,641	53	2,372	10,940
2023	0	117	674	8,047	41	1,740	10,619

Note: 1) Based on Regulation of the Minister of Energy and Mineral Resources No. 12 year 2015 regarding to mandatory of minimum biodiesel utilization as blending product of gasoil by 30% in 2020

5.5.3 Share of Energy Consumption in Others Sector

(%)

Year	Mogas	Kerosene	Gasoil CN 48	Bio-Gasoil[1)]	MDF	Fuel Oil
2013	16.47	0.94	76.37	0.00	0.21	6.02
2014	17.97	0.78	74.84	0.00	0.18	6.23
2015	22.48	0.82	69.30	0.00	0.20	7.20
2016	18.95	0.70	70.62	0.00	0.18	9.56
2017	12.76	0.84	74.33	0.00	0.48	11.60
2018	13.75	1.02	69.19	0.00	0.43	15.60
2019	18.25	1.18	5.02	60.82	0.42	14.30
2020	14.64	1.19	10.14	61.65	0.34	12.04
2021	5.57	1.13	17.43	63.36	0.42	12.10
2022	0.01	1.07	6.92	69.84	0.48	21.68
2023	0.00	1.10	6.35	75.78	0.38	16.38

Note: 1) Based on Regulation of the Minister of Energy and Mineral Resources No. 12 year 2015 regarding to mandatory of minimum biodiesel utilization as blending product of gasoil by 30% in 2020

06
ENERGY SUPPLY BY ENERGY RESOUCES

6.1.1 Coal Resources and Reserves

as of December 2023

(Million Ton)

Province	Exploration Target[1)]	Total Inventory [1)]	Resources[1)]				Verified Resources[2)]	Reserves[1)]	Verified Reserves[2)]
			Inferred	Indicated	Measured	Total			
Banten	5.47	52.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Central Java	0.00	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00
East Java	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aceh	1.16	20.92	279.13	424.70	403.06	1,106.89	895.67	583.13	485.47
North Sumatera	0.00	14.62	10.24	8.48	7.55	26.26	0.00	7.12	0.00
Riau	36.10	412.05	295.91	344.78	329.95	970.64	966.61	372.71	371.30
West Sumatera	1.19	315.89	27.87	17.00	55.00	99.88	64.12	34.93	12.87
Jambi	142.37	1,576.74	1,039.30	1,142.94	2,016.24	4,198.48	3,432.93	1,707.74	1,577.37
Bengkulu	36.86	208.61	138.24	106.34	171.43	416.01	371.42	110.46	94.17
South Sumatera	4,885.39	10,581.29	7,584.67	9,849.83	8,388.08	25,822.58	22,625.34	8,987.46	8,671.03
Lampung	0.00	106.95	10.25	24.28	60.32	94.85	0.00	60.32	0.00
West Kalimantan	2.26	463.44	0.98	0.48	0.00	1.46	1.46	0.43	0.43
Central Kalimantan	35.39	2,893.20	4,004.52	3,194.65	2,947.56	10,146.72	9,123.65	3,016.46	2,555.90
South Kalimantan	7.83	1,363.81	3,225.20	3,206.60	6,915.91	13,347.72	12,896.08	4,072.47	3,906.10
East Kalimantan	890.55	15,093.44	7,782.11	12,705.25	17,892.25	38,379.61	37,796.79	11,779.85	11,586.05
North Kalimantan	25.79	333.32	880.04	841.50	936.86	2,658.40	2,583.65	974.62	952.43
West Sulawesi	11.46	26.26	1.30	1.00	0.85	3.15	3.15	0.00	0.00
South Sulawesi	13.79	25.74	3.02	1.84	0.72	5.57	5.57	1.77	1.77
Southeast Sulawesi	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Central Sulawesi	0.52	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00
North Maluku	8.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
West Papua	93.66	32.82	6.00	5.70	7.20	18.90	18.90	4.09	4.09
Papua	7.20	31.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	6,205.84	33,555.52	25,288.78	31,875.35	40,132.99	97,297.11	90,785.34	31,713.55	30,218.98

Source : Geological Agency

Note : 1) Classification based on Indonesian National Standard 5015-2019

2) Verified by Competent Person Indonesia

6.1.2 Coal Supply

(Ton)

Year	Production[1)]	Export	Import
	Steam Coal		
2013	474,371,369	356,357,973	609,875
2014	458,096,707	381,972,830	2,442,319
2015	461,566,080	365,849,610	3,031,677
2016	456,197,775	331,128,438	4,113,764
2017	461,248,184	286,936,795	4,723,755
2018	557,772,940	356,394,687	5,468,706
2019	616,159,594	454,500,164	7,391,172
2020	563,728,255	405,052,868	8,756,363
2021	613,990,256	435,217,208	14,469,013
2022	687,432,384	465,335,605	12,492,657
2023	775,181,855	518,045,831	14,457,536

Sources : 1. Directorate General of Mineral and Coal
2. Ministry of Trade and BPS for Import Data
Note : 1) The type of coal produced in Indonesia is only steam coal

6.1.3 Indonesia Coal Export by Destination

(Thousand Ton)

Year	China	India	Japan	South Korea	Taiwan	Hongkong		Malaysia	Philippines	Thailand	Spain	Others	Total
2013	49,859	41,834	21,709	13,635	14,399	4,990		9,066	7,609	5,253	796	187,207	356,358
2014	67,807	60,284	31,232	20,170	15,689	13,697		10,772	10,274	8,497	5,675	137,876	381,973
2015	41,898	79,111	23,252	14,111	10,643	7,263		7,719	11,816	9,380	3,846	156,810	365,850
2016	53,887	56,277	29,798	13,574	12,784	6,475		11,265	13,434	8,720	3,532	121,381	331,128
2017	51,201	46,241	22,177	17,284	10,230	5,715		13,651	10,443	5,379	2,437	102,178	286,937
2018	63,429	49,967	23,081	18,732	7,615	3,423		12,701	12,212	6,611	3,227	155,397	356,395
2019	144,415	116,949	27,679	29,743	21,140	7,502		24,188	26,846	17,286	1,175	37,577	454,500
2020	127,789	97,507	26,970	24,778	17,009	3,864		26,192	27,483	16,884	0	36,578	405,053
2021	196,243	72,124	22,740	21,260	16,199	5,301		25,588	30,160	15,294	77	30,230	435,217
2022	173,323	109,843	26,474	26,297	18,038	5,108		25,314	30,780	15,533	408	34,217	465,336
2023	218,207	107,976	25,603	25,955	14,968	4,931		28,109	36,083	11,736	0	44,479	518,046

Source : Directorate General of Mineral and Coal
Note : Since 2019 based on surveyor report

6.1.4 Domestic Coal Sales

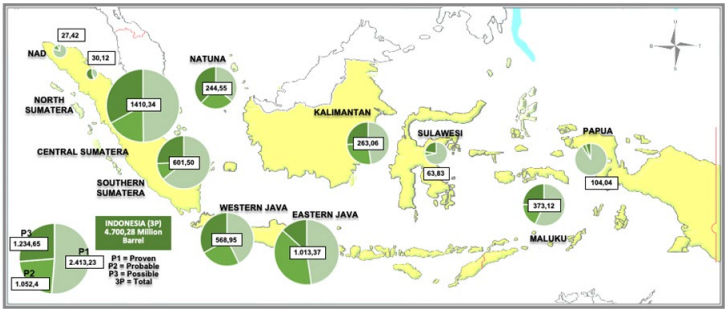
(Ton)

Year	Total	Iron, Steel & Metal-lurgy[1)]	Power Plant	Cement, Textile, Fertilizer	Pulp & Paper	Briquette	Others[2)]
2013	72,070,000	300,000	61,860,000	7,190,000	1,460,000	36,383	1,223,617
2014	76,180,001	298,000	63,054,000	7,187,400	1,458,170	15,623	4,166,808
2015	86,814,099	399,000	70,080,000	7,180,000	4,310,000	13,174	4,831,925
2016	90,550,000	390,000	75,400,000	10,540,000	4,190,000	30,000	0
2017	97,030,000	300,000	83,000,000	9,802,000	3,898,000	30,000	0
2018	115,080,000	1,750,000	91,140,000	19,030,000	3,150,000	10,000	0
2019	138,418,192	10,064,750	98,550,260	22,515,239	3,304,980	7,969	3,974,994
2020	131,886,643	13,210,585	104,829,892	6,511,942	2,000,387	52,826	5,281,012
2021	133,043,362	11,393,020	112,133,733	4,681,560	1,116,329	0	3,718,720
2022	215,813,239	49,375,407	129,226,621	13,112,483	6,300,036	0	17,798,692
2023	212,867,547	60,111,682	121,197,161	9,808,254	5,376,405	980	16,373,065

Source : Directorate General of Mineral and Coal
Note : 1) In 2018 - 2019, there is acceleration for downstream mineral industry
2) In 2013 - 2015, others sales include trader
Since 2016, others sales not include trader
In 2019 companies report the data through online reporting which consist the plantation, forestry and uncategorized sales. There is estimation of uncategorized sales data into cement, textile & fertilizer also pulp & paper.

6.2.1 Oil Reserves

as of 1 January



Picture: Oil Reverses per Regional

(Billion Barrel)

Year	Reserves			Contingent Resources	
	Proven[2)]	Potential[3)]	Total	(C1)[4)]	(C2+C3)[5)]
2023[1)]	2.41	2.29	4.70	1.46	2.56

Source : Directorate General of Oil and Gas
Note : 1) Based on new parameter of Petroleum Resources Management System 2018 (it was considered as an oil reserves, however part of oil reserves has not been developed, it has been categorized as contingent resources since 2019)
2) Proven reserves = P1
3) Potential reserves = P2 + P3
4) Contingent resources = low estimate (C1)
5) Contingent resources = medium estimate (C2) + high estimate (C3)

6.2.2 Refinery Capacity in 2023

(MBSD)

Refinery	Refinery Capacity
Dumai	177.00
Musi	127.30
Cilacap	348.00
Balikpapan	260.00
Balongan	125.00
Cepu	3.80
Kasim	10.00
Tuban (TPPI)	100.00
Total	1,151.10

Source : Directorate General of Oil and Gas

6.2.3 Crude Oil Supply and Demand

Year	Production	Export	Import	Oil Refinery Input	
	Thousand bbl	Thousand bbl	Thousand bbl	Crude (thousand bbl)	Crude (thousand bpd)
2013	300,830	104,791	118,334	300,134	822
2014	287,902	93,080	121,993	309,445	848
2015	286,814	115,063	136,666	271,372	743
2016	303,336	125,541	148,361	323,910	887
2017	292,374	102,723	141,616	323,142	885
2018	281,780	74,472	126,082	334,281	916
2019	272,025	25,971	89,315	334,963	918
2020	259,247	31,448	79,685	302,344	826
2021	240,367	43,769	104,403	300,371	823
2022	223,532	15,494	104,722	322,541	884
2023	221,089	21,396	132,386	331,038	907

Source : Directorate General of Oil and Gas

6.2.4 Domestic Oil Fuels Sales

(Kilo Liter)

Fuel Types	2013	2014	2015	2016	2017		2018	2019	2020	2021	2022	2023 [3]
AvGas	2,868	1,499	3,070	3,172	2,964		3,808	2,366	1,453	1,047	1,409	1,670
Avtur	4,159,010	4,229,094	4,336,624	4,875,486	5,371,183		5,717,729	5,030,485	2,774,198	2,031,726	3,320,032	4,331,309
RON 88	29,501,773	29,707,002	28,107,022	21,679,698	12,492,553		10,754,461	11,685,293	8,640,647	3,461,421	6,303	0
Kerosene	1,260,490	971,434	769,233	598,769	613,750		599,712	565,815	525,635	523,516	504,040	503,151
Gasoil CN48 [1]	23,715,716	21,440,501	15,016,321	14,005,096	12,614,727		9,378,959	556,859	1,037,405	1,876,903	755,527	673,363
MDF	79,137	60,870	53,069	42,163	98,288		71,239	56,702	42,308	54,426	63,801	49,158
Fuel Oil	1,973,903	1,884,040	1,647,441	2,002,773	2,079,400		2,233,655	1,675,675	1,300,292	1,376,456	2,501,065	1,834,360
Gasoline RON 95 [2]	158,714	154,888	278,758	366,168	379,998		385,977	326,569	353,168	481,184	320,353	361,338
Gasoline RON 92	850,408	1,062,920	2,761,956	4,780,929	6,188,300		5,643,055	4,254,343	4,056,945	5,713,190	5,776,110	5,438,351
Gasoline RON 90	n.a	n.a	379,959	5,805,228	14,487,098		17,706,790	19,410,819	18,143,189	23,297,401	29,697,521	30,223,847
Gasoil CN53	n.a	n.a	n.a	136,311	178,695		199,901	287,043	268,111	333,628	374,782	374,152
Gasoil CN51	23,053	33,305	38,552	105,889	391,895		666,191	547,193	507,151	701,009	1,024,064	827,325
BioGasoil	10,332,005	11,232,729	14,156,373	13,747,237	16,078,292		20,717,619	30,045,699	28,074,488	30,385,449	33,964,755	35,773,521
Total Oil Fuel	72,057,077	70,778,283	67,548,378	68,148,919	70,977,143		74,079,096	74,444,861	65,724,990	70,237,358	78,309,753	80,391,543

Sources : Directorate General of Oil and Gas; Regulatory Body for Oil and Gas of Downstream
Note : 1) Since 2019, there is only relaxation of sales of pure Gasoil CN 48 to the Military Equipment, PT PLN and PT Freeport Indonesia
2) Addition of domestic sales of RON 98 since 2016
3) Temporary Data for 2023

6.2.5 Refinery Production by Type

(Thousand Barrel)

Year	Gasoline RON 88 + RON 90	Avtur + JP5	Kerosene	Gasoil CN48	MDF		Fuel Oil	Gasoline RON 95, RON 98, & RON 100	Gasoline RON 92	Gasoil CN51 & CN53	Total Oil Fuel
2013	67,819	18,623	9,614	122,907	927		13,879	566	2,651	517	237,505
2014	70,829	19,938	7,332	129,502	1,107		12,243	545	3,629	382	245,507
2015	71,733	20,240	4,977	129,306	972		11,979	672	8,725	242	248,846
2016	68,878	22,794	6,459	123,818	969		18,309	592	24,432	503	266,753
2017	53,712	22,917	6,041	133,920	876		9,827	604	39,085	577	267,559
2018	56,313	26,255	5,958	139,783	714		12,034	779	36,877	1,870	280,584
2019	51,378	29,716	6,961	135,062	503		11,177	1,051	42,424	1,932	280,204
2020	41,830	19,394	4,751	121,197	820		10,893	1,625	48,294	2,671	251,475
2021	62,216	15,259	2,394	130,584	191		12,083	2,469	28,572	2,274	256,041
2022	78,229	18,904	2,552	129,708	146		20,646	1,303	7,495	2,677	261,659
2023	83,104	26,316	2,405	126,703	91		25,420	606	5,870	2,620	273,134

Source : Directorate General of Oil and Gas

6.2.5 Refinery Production by Type (Continued)

(Thousand Barrel)

Year	Secondary Fuel				Non Fuel		Lubricant	LPG	HOMC	Total Production
	Naphtha	LOMC	LSWR	Total						
2013	23,793	0	23,743	47,536	21,726		2,697	6,635	6,564	322,664
2014	21,985	243	26,946	49,174	30,460		2,529	6,362	8,544	342,577
2015	13,089	3,131	24,713	40,933	27,175		0	8,084	4,498	329,536
2016	13,641	107	24,798	38,546	15,770		2,019	10,297	6,904	340,289
2017	18,165	1,223	26,565	45,953	22,470		2,457	10,062	8,254	356,755
2018	19,334	349	22,815	42,498	22,656		2,787	10,289	6,763	365,576
2019	18,782	0	26,162	44,944	23,093		2,332	9,936	6,269	366,779
2020	16,006	0	21,497	37,504	27,032		2,339	10,183	6,311	334,844
2021	231	0	4,905	5,137	23,666		2,160	10,145	79	297,228
2022	1,406	0	14,806	16,213	24,262		2,073	10,073	112	314,391
2023	568	0	14,487	15,055	21,843		1,695	10,762	128	322,617

Source : Directorate General of Oil and Gas

6.2.6 Import of Refined Products

(Thousand KL)

Year	Avtur	AvGas	Gasoline RON 88 & RON 90[1)]	Gasoline RON 95	Gasoline RON 92		Naphta	HOMC	Gasoil	Fuel Oil	MDF	Total Oil Fuel
2013	948	2	18,340	60	268		0	1,015	11,947	107	6	32,693
2014	981	0	18,829	64	619		0	1,093	11,475	174	7	33,242
2015	1,153	3	17,211	57	1,303		0	1,031	7,040	487	8	28,293
2016	1,119	2	12,879	140	3,783		66	33	4,861	585	31	23,500
2017	1,786	3	10,423	180	7,012		0	759	6,882	392	59	27,496
2018	1,518	4	9,229	277	9,295		15	447	6,499	893	47	28,225
2019	280	2	11,084	150	7,954		46	948	3,873	358	32	24,729
2020	0	1	9,732	106	6,157		278	218	3,182	216	39	19,929
2021	0	1	8,145	101	9,840		38	576	3,190	175	21	22,087
2022	448	2	15,106	115	6,391		0	369	5,270	154	6	27,861
2023	278	1	16,122	267	4,666		0	215	5,145	197	7	26,897

Source : Directorate General of Oil and Gas
Note : 1) Since 2018, include Gasoline RON 90

6.2.7 Export of Refined Products

(Thousand Barrel)

Year	Avtur	Kerosene	Gasoil CN 48	Fuel Oil	Gasoline RON 92		Gasoline RON 95	Total Oil Fuel	Naphtha	Other Product	Total
2013	9	1,632	0	4,319	84		13	6,057	1,092	19,693	26,843
2014	13	401	148	3,215	159		0	3,936	5,339	23,342	32,616
2015	15	589	0	1,377	15		0	1,997	2,550	19,208	23,755
2016	15	0	1	2,167	9		0	2,192	0	10,666	12,858
2017	15	0	8	2,981	4		0	3,008	0	11,814	14,822
2018	16	0	4	2,011	0		0	2,031	0	12,047	14,078
2019	795	0	0	0	0		0	795	0	15,060	15,855
2020	2,886	0	697	346	0		0	3,928	0	16,519	20,447
2021	1,052	0	0	0	0		0	1,052	0	11,851	12,903
2022	11	0	0	10,589	0		0	10,600	0	18,253	28,852
2023	10	0	1	14,189	1		0	14,201	0	18,858	33,059

Source : Directorate General of Oil and Gas
Note : Exclude Petrochemical and Lubricant Refinery

6.2.8 Indonesia Crude Oil Export by Destination

(Thousand Barrel)

Year	Japan	USA	South Korea	Taiwan	Singa-pore	Others	Total
2013	43,042	5,872	10,096	3,257	11,108	31,415	104,791
2014	32,625	6,811	7,586	5,272	13,680	27,106	93,080
2015	26,634	13,648	8,481	5,244	15,567	45,489	115,063
2016	18,404	9,943	6,619	6,525	13,581	70,470	125,541
2017	11,901	11,986	7,466	7,543	12,371	51,455	102,723
2018	9,943	10,235	7,122	6,172	7,222	33,777	74,472
2019	160	0	1,765	675	895	22,476	25,971
2020	0	0	635	0	4,573	26,240	31,448
2021	1,094	0	300	575	5,617	36,183	43,769
2022	220	0	225	0	1,154	13,895	15,494
2023	1,693	0	806	0	1,332	17,565	21,396

Source : Directorate General of Oil and Gas

6.2.9 LPG Supply and Demand

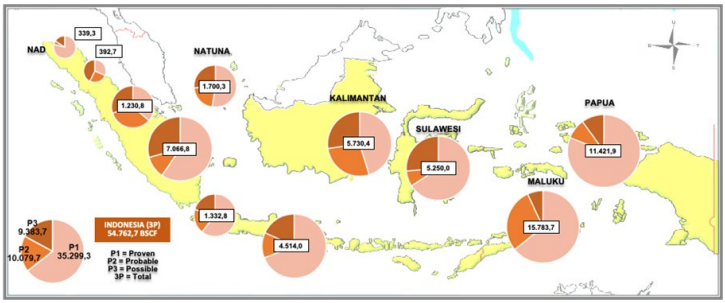
(Ton)

Year	Production			Export	Import	Sales
	Gas Refinery	Oil Refinery	Total			
2013	1,447,055	563,935	2,010,990	286	3,299,808	5,607,430
2014	1,831,683	547,445	2,379,128	483	3,604,009	6,093,138
2015	1,631,599	675,808	2,307,407	408	4,237,499	6,376,990
2016	1,394,804	831,398	2,226,202	494	4,475,929	6,642,633
2017	1,141,552	865,366	2,006,918	372	5,461,934	7,190,871
2018	1,119,049	883,305	2,002,354	434	5,566,572	7,562,893
2019	1,113,475	821,697	1,935,172	457	5,714,693	7,777,990
2020	1,063,499	858,153	1,921,652	334	6,396,962	8,023,805
2021	1,038,750	863,807	1,902,557	351	6,336,354	8,358,499
2022	1,084,956	901,338	1,986,294	174	6,739,131	8,562,019
2023	1,017,036	958,155	1,975,191	209	6,950,651	8,710,547

Source : Directorate General of Oil and Gas

6.3.1 Natural Gas Reserves

as of 1 January



Picture: Natural Gas Reserves per Regional

(TSCF)

Year	Reserves			Contingent Resources	
	Proven[2)]	Potential[3)]	Total	(C1)[4)]	(C2+C3)[5)]
2023[1)]	35.30	19.46	54.76	16.87	27.94

Source : Directorate General of Oil and Gas
Note : 1) Based on new parameter of Petroleum Resources Management System 2018
(it was considered as an oil reserves, however part of oil reserves has not been developed, it has been categorized as contingent resources since 2019)
2) Proven reserves = P1
3) Potential reserves = P2 + P3
4) Contingent resources = low estimate (C1)
5) Contingent resources = medium estimate (C2) + high estimate (C3)

6.3.2 Gas Stream

Year	Gross Natural Gas Production	Gas Lift & Reinjection	Own Use	Flare	Net Natural Gas Production	LNG Plant (feed)	LPG Plant (feed)	LNG Production
	(MMSCF)	(MMSCF)	(MMSCF)	(MMSCF)	(MMSCF)	(MMSCF)	(MMSCF)	(Thousand MMBTU)
2013	3,120,838	156,154	217,416	237,295	2,727,389	1,040,992	26,647	1,013,158
2014	3,175,791	176,267	219,652	311,614	2,687,910	866,954	29,757	957,179
2015	3,116,142	168,045	214,306	273,402	2,674,695	1,025,789	24,801	1,003,747
2016	3,070,239	170,421	202,571	262,773	2,637,045	1,064,632	24,805	1,064,671
2017	2,963,184	182,030	212,108	229,128	2,552,026	988,771	22,418	1,011,608
2018	2,996,802	163,226	222,365	270,762	2,562,814	1,116,888	29,842	1,003,194
2019	2,809,668	168,954	213,721	269,132	2,371,582	834,243	20,167	865,034
2020	2,670,727	175,468	205,300	55,781	2,439,479	683,474	11,161	812,385
2021	2,670,787	185,281	203,369	51,829	2,433,677	664,796	11,509	774,329
2022	2,617,825	191,738	201,349	56,429	2,369,657	660,367	11,172	789,113
2023	2,736,365	252,083	212,129	64,222	2,420,060	717,313	9,534	847,890

Sources : Directorate General of Oil and Gas; Special Task Force for Upstream Oil and Gas Business Activities
Note : New Table Format

6.3.3 Gas Utilization

Year	Utilization						Utilization					
	Gas Fuel	City Gas	Lifting	Fertilizer	Electricity		Refinery	Industry	LNG Domestic	LPG Domestic	Export Pipeline Gas	Export LNG
	(Thousand MMBTU)	(Thousand MMBTU)	(Thousand MMBTU)	(Thousand MMBTU)	(Thousand MMBTU)		(Thousand MMBTU)	(Thousand MMBTU)	(Thousand MMBTU)	(Thousand MMBTU)	(Thousand MMBTU)	(Thousand MMBTU)
2013	1,172	215	99,760	268,583	400,559		38,866	452,441	90,885	67,525	353,436	888,410
2014	1,388	549	115,355	251,582	368,640		41,992	444,058	93,385	86,750	352,350	834,244
2015	1,635	861	99,762	265,986	363,409		47,384	444,304	113,968	79,501	316,918	811,043
2016	1,310	923	71,201	254,679	368,999		105,138	433,167	157,473	65,957	294,663	749,171
2017	2,576	1,363	65,660	251,867	338,767		50,033	517,799	136,014	52,267	290,435	708,340
2018	3,410	1,333	68,907	265,218	302,824		42,322	569,973	147,880	56,325	278,021	696,340
2019	2,792	2,238	66,280	271,078	306,144		40,917	542,141	185,511	37,559	269,494	517,205
2020	1,686	2,464	63,214	252,160	249,193		46,083	511,727	139,211	47,165	261,986	507,522
2021	1,431	3,073	61,240	248,919	248,164		41,497	534,575	174,934	32,138	274,736	472,354
2022	1,807	4,059	68,547	251,284	226,490		72,442	512,007	178,678	28,959	219,113	434,773
2023	2,135	5,862	77,902	251,098	253,193		72,004	588,325	207,419	29,310	181,044	473,723

Sources : Directorate General of Oil and Gas; Special Task Force for Upstream Oil and Gas Business Activities
Note : New Table Format

6.3.4 City Gas Sales and Utilization

Year	Sales (Million M^3)					Number of Customer			
	Household	Industry & Commercial	Transportation	Total		Household	Commercial Industry[1)]	Small Customer[2)]	Total
2013	19	5,159	28	5,206		88,613	1,395	1,582	91,590
2014	18	5,302	31	5,351		92,858	1,405	1,786	96,049
2015	18	4,765	37	4,820		107,690	1,529	1,857	111,076
2016	22	4,638	31	4,690		127,246	1,652	1,929	130,827
2017	28	4,708	14	4,749		192,489	1,490	2,242	196,221
2018	32	4,930	35	4,997		198,075	1,719	1,973	201,767
2019	37	4,837	30	4,904		233,204	1,750	2,114	237,068
2020	43	4,317	11	4,371		279,856	1,760	2,286	283,902
2021	49	4,837	10	4,896		352,928	1,776	2,413	357,117
2022	57	5,268	10	5,335		460,864	1,819	2,452	465,135
2023	62	5,227	13	5,302		574,350	2,563	1,976	578,889

Source : PT PGN (Persero)
Note : 1) Changing category of customer from Commercial to Small Customer since 2013
2) Changing names of Industry to Commercial Industry Since 2013

6.4.1 Power Plant Installed Capacity

(MW)

Year	On Grid																Total On Grid
	Hydro PP	Steam PP	Gas PP	Combined Cycle PP	Geothermal PP	Diesel PP	Gas Engine PP	Wind PP		Mycro Hydro PP	Mini Hydro PP	Solar PP	Coal Gasifi-cation PP	Waste PP	BioGas PP	Biomass PP	
2013	5,058.87	23,812.53	4,389.08	9,852.21	1,343.50	5,935.00	448.12	0.63		29.69	77.05	9.02	6.00	26.00	0.00	0.00	50,987.69
2014	5,059.06	25,104.23	4,310.50	10,146.11	1,403.50	6,206.99	610.74	1.12		30.46	139.87	9.02	6.00	36.00	0.00	0.00	53,063.60
2015	5,068.59	26,447.58	4,495.56	10,293.47	1,438.30	3,824.07	1,101.23	1.46		90.15	148.71	36.94	0.00	15.65	54.72	1,671.29	54,687.72
2016	5,343.59	28,351.97	4,969.24	10,293.47	1,533.30	3,979.40	1,806.99	1.46		95.87	211.40	46.70	0.00	15.65	64.16	1,703.29	58,416.48
2017	5,343.59	30,768.07	4,976.24	10,418.47	1,808.30	4,396.35	2,264.85	1.46		103.76	240.55	54.48	0.00	15.65	100.62	1,740.54	62,232.93
2018	4,461.59	31,587.17	5,348.44	11,220.10	1,948.30	4,630.90	2,357.66	143.03		98.39	267.79	24.42	0.00	15.65	40.35	142.02	62,285.81
2019	4,620.52	34,737.17	5,348.44	11,669.54	2,130.70	4,779.68	2,842.03	153.83		99.49	311.14	105.03	0.00	15.65	42.15	147.02	67,002.40
2020	4,700.67	36,667.86	5,348.44	12,235.71	2,130.70	4,863.53	3,177.93	153.83		99.49	375.84	107.37	0.00	15.65	18.60	150.52	70,046.14
2021	5,050.67	37,036.36	5,348.44	12,411.51	2,286.05	4,986.58	3,218.87	153.83		100.13	486.65	155.29	0.00	28.45	22.10	151.52	71,436.45
2022	5,050.67	46,014.26	4,456.74	13,397.82	2,360.33	4,352.09	2,976.47	153.83		102.27	572.67	190.06	30.00	24.45	24.11	157.42	79,863.19
2023	4,642.07	49,756.37	4,453.27	16,065.76	2,597.51	4,638.31	2,689.32	151.82		51.07	908.50	323.46	250.00	36.47	36.51	167.86	86,768.29

6.4.1 Power Plant Installed Capacity (Continued)

(MW)

Year	Off Grid								Off Grid			Grand Total On Grid + Off Grid
	Hydro PP	Micro Hydro PP	Solar PP + Solar PV	Wind PP	Biomass PP	BioGas PP	Hybrid PP[4)]		Solar-Powered Public Street Lighting[3)]	Solar-Powered Energy Saving Lamp	Total Off Grid	
2018	938.00	6.38	28.19	0.48	1,616.52	68.26	3.58		5.28	7.58	2,668.99	64,954.80
2019	938.00	6.88	29.88	0.48	1,616.52	70.26	3.58		9.23	10.90	2,676.50	69,678.90
2020	938.00	6.88	29.02	0.48	1,616.52	99.22	3.58		16.04	10.90	2,704.59	72,750.73
2021	938.00	26.30	34.86	0.48	1,969.64	112.69	3.58		23.95	10.94	3,096.49	74,532.94
2022	938.00	25.41	82.16	0.48	2,767.63	125.30	0.00		29.74	10.92	3,949.90	83,813.09
2023	968.00	0.00	265.59	0.48	3,033.15	119.42	0.00		37.18	10.92	4,397.56	91,165.85

Source : PLN Statistics and Electricity Statistics, Directorate General of Electricity, Directorat General of New and Renewable Energy and Energy Conservation

Note: 1) Unaudited Data for 2023
2) On Grid is Including Private Power Utility and Own Use Electricity Supply Business License (IUPTLS)
3) Off Grid means power plant for NRE based outside PLN's electricity interconnection grid
4) Diesel PP including captive power
5) Solar-Powered Public Street Lighting not included in the total power plant capacity

6.4.2 Power Plant Production

(GWh)

Year	PLN													PLN	Sub-Total
	Hydro PP	Geo-ther-mal PP	Solar PP	Diesel PP	Steam PP					Steam PP	Com-bined Gas-Steam	Gas PP	Gas Engine PP	Wind PP	
					Coal	Oil	Gas	Cofiring		Total					
2013	13,014	4,345	5.48	18,919	75,193	1,055	5,602	-		81,850	36,493	8,958	382	0	163,966
2014	11,164	4,285	6.81	21,862	83,397	759	5,856	-		90,012	38,800	9,117	51	0	175,297
2015	10,005	4,392	5.28	18,859	85,191	11,419	146	-		96,756	39,316	5,907	1,233	0	176,472
2016	13,886	3,958	8.78	19,122	92,682	1,092	4,488	-		98,262	42,377	3,745	2,451	0	183,809
2017	12,425	4,096	5.84	16,453	101,333	285	4,159	-		105,778	38,468	4,117	82	0	181,425
2018	10,729	4,013	4.56	15,019	110,035	517	3,846	4		114,402	39,017	5,357	157	0	188,698
2019	9,877	4,110	5.00	9,053	119,520	126	3,730	0		123,376	37,758	3,213	6,151	0	193,543
2020	11,949	4,186	5.65	5,601	113,335	34	1,413	11		114,793	30,098	2,414	8,646	0	177,692
2021	11,869	4,217	5.66	6,034	113,488	225	950	274		114,937	33,612	2,797	9,503	0	182,974
2022	13,175	4,138	9.09	5,993	114,728	9	288	599		115,624	33,322	2,147	9,411	0	183,819
2023	10,655	4,311	12.84	6,482	112,035	76	1,852	1,042		115,006	36,726	1,652	9,137	0	183,981

Source : PLN Statistics and Electricity Statistics, Directorate General of Electricity

6.4.2 Power Plant Production (Continued)

(GWh)

Year	PLN Purchase from IPP & PPU								PLN Purchase from IPP & PPU							Total On Grid
	Hydro PP	Geo-ther-mal PP	Solar PP	Diesel PP	Steam PP			Combined Gas-Steam PP	Gas PP	Gas Engine PP	Wind PP	Biomass PP	Biogas PP	Waste PP	Sub-Total	
					Coal	Gas	Total									
2013	3,909	5,069	0.02	388	36,059	147	36,349	4,939	1,529	0	0	144	0	41	52,223	216,189
2014	3,998	5,753	0.00	418	36,135	137	36,477	4,981	1,595	0	0	205	0	36	53,258	228,555
2015	3,736	5,656	0.00	633	39,466	115	40,043	5,330	2,090	0	4	461	0	19	57,510	233,982
2016	4,791	6,698	12.31	586	42,699	129	43,411	5,832	2,767	0	6	584	0	6	64,109	247,918
2017	6,207	8,668	23.21	2,110	46,631	263	46,894	5,704	3,002	35	0	534	52	5	73,235	254,660
2018	6,099	10,006	14.71	2,410	49,978	242	50,220	4,946	3,841	41	188	526	95	1	78,387	267,085
2019	6,669	9,990	49.28	1,403	54,973	228	55,201	5,396	5,577	266	482	219	126	21	85,399	278,942
2020	7,506	11,377	120.32	1,129	67,534	19	67,553	4,045	4,028	613	473	195	102	17	97,159	274,851
2021	7,895	11,682	113.96	389	76,196	0	76,196	4,363	4,190	850	435	222	150	11	106,497	289,471
2022	9,180	12,539	208.64	87	90,580	0	90,580	5,153	4,410	1,395	354	159	166	44	124,276	308,095
2023	9,277	12,625	165.03	0	104,742	0	104,742	6,888	3,593	1,158	479	176	175	61	139,340	323,321

Source : PLN Statistics and Electricity Statistics, Directorate Geneneral of Electricity

6.4.2 Power Plant Production (Continued)

(GWh)

Year	Off Grid[1)]						Off Grid[1)]			Total Off Grid	Grand Total
	Hydro PP	Micro Hydro PP	Solar PP + Solar PV	Wind PP	Biomass PP		Biogas PP	Solar-Powered Public Street Lighting	Solar-Powered Energy Saving Lamp		
2013	n.a	n.a	n.a	n.a	n.a		n.a	n.a	n.a	0	216,189
2014	n.a	n.a	n.a	n.a	n.a		n.a	n.a	n.a	0	228,555
2015	n.a	n.a	n.a	n.a	n.a		n.a	n.a	n.a	0	233,982
2016	n.a	n.a	n.a	n.a	n.a		n.a	n.a	n.a	0	247,918
2017	n.a	n.a	n.a	n.a	n.a		n.a	n.a	n.a	0	254,660
2018	4,785	24	56	2	11,325		478	5	10	16,690	283,776
2019	4,579	36	44	2	11,329		492	6	14	16,507	295,449
2020	4,834	36	23	2	11,360		697	8	14	16,980	291,831
2021	4,814	119	48	2	13,803		790	11	14	19,605	309,076
2022	4,806	134	144	2	19,396		878	52	30	25,442	333,537
2023	4,658	0	465	2	21,256		837	51	19	27,288	350,609

Source : PLN Statistics and Electricity Statistics, Directorate General of Electricity
Note: 1) Off grid consist of captive power from PPU, Power Plant financed by State Budget and Power Plant financed by Non-Governmental

6.4.3 Import of Electricity

(GWh)

Year	Country of Origin	Hydro PP
2013	Malaysia	3.03
2014	Malaysia	8.99
2015	Malaysia	12.75
2016	Malaysia	692.70
2017	Malaysia	1,119.47
2018	Malaysia	1,495.89
2019	Malaysia	1,683.12
2020	Malaysia	1,553.00
2021	Malaysia	972.73
2022	Malaysia	797.38
2023	Malaysia	892.91

Source : Directorate General of Electricity
Note : Including Serawak Energy Bhd

6.4.4 Electricity Sales

(GWh)

Year	Electricity Sales / Tariff Segment			
	Household	Commercial	Industry	Street Lighting
2013	77,211	34,369	64,381	3,251
2014	84,086	36,128	65,909	3,394
2015	88,682	36,773	64,079	3,448
2016	93,635	39,852	68,145	3,498
2017	94,457	41,459	72,238	3,527
2018	97,832	43,753	76,947	3,627
2019	103,733	46,600	77,879	3,633
2020	112,156	42,527	72,240	3,635
2021	115,370	44,124	80,904	3,545
2022	116,095	50,188	88,483	3,582
2023	122,340	56,728	88,588	3,615

Source : Directorate General of Electricity and PLN Statistic

6.4.4 Electricity Sales (Continued)

(GWh)

Year	Electricity Sales / Tariff Segment			
	Social	Government	Transportation	Total
2013	4,939	3,261	129	187,541
2014	5,446	3,484	155	198,602
2015	5,941	3,717	205	202,846
2016	6,631	4,022	223	216,004
2017	7,095	4,121	236	223,134
2018	7,781	4,403	274	234,618
2019	8,622	4,750	301	245,518
2020	8,098	4,635	292	243,583
2021	8,666	4,708	317	257,634
2022	10,073	4,995	344	273,761
2023	11,496	5,285	384	288,436

Source : Directorate General of Electricity and PLN Statistic

6.4.5 Fuel consumption of PLN Power Plant

(GWh)

Year	Coal	HSD	IDO	FO	Natural Gas	Biofame
	(ton)	(KL)	(KL)	(KL)	(MMSCF)	(KL)
2013	39,601,034	6,291,667	3,221	1,179,604	409,890	0
2014	44,604,981	6,330,517	3,849	1,096,638	450,190	0
2015	48,995,169	4,377,068	2,244	904,266	456,494	0
2016	50,556,446	3,719,090	915	947,027	505,125	0
2017	54,711,847	2,879,181	580	718,462	447,072	0
2018	60,481,245	2,780,973	28	946,516	465,419	0
2019	67,008,829	2,011,022	329	639,785	479,776	467,626
2020	66,158,000	1,568,160	26	164,495	334,596	607,569
2021	67,860,420	2,005,335	329	207,762	397,765	643,740
2022	69,876,930	2,072,688	104	190,170	356,832	718,060
2023	69,222,936	2,155,595	799	221,071	417,039	847,487

Source : PLN Statistic

6.4.6 Electricity System Perfomance

(GWh)

Year	Average Thermal Efficiency	Capacity Factor	Load Factor	Peak Load	Transmission & Distribussion Losses
	(%)	(%)	(%)	(MW)	(%)
2013	27.18	54.72	80.04	30,834	9.05
2014	26.80	50.94	78.26	33,321	8.98
2015	26.92	50.53	80.02	33,381	8.87
2016	30.33	51.92	62.62	32,204	8.70
2017	27.02	51.98	74.93	38,797	9.75
2018	26.62	52.73	75.76	37,944	9.55
2019	25.84	50.68	76.41	41,671	9.35
2020	25.48	49.54	78.32	41,761	9.12
2021	24.69	51.19	77.23	42,785	8.61
2022	24.54	50.93	84.11	43,485	8.76
2023	24.35	50.58	63.33	58,282	8.63

Source : Directorate General of Electricity and PLN Statistic
Note : Unaudited Data for 2023

6.5.1 Geothermal Resources and Reserves

as of December 2023

(MW)

No	Location	Resources		Reserves			Total
		Speculative	Hipotethical	Possible	Probable	Proven	
1	Sumatera	2,161	1,561	3,780	760	1,361	9,623
2	Jawa	1,119	1,303	3,489	257	1,765	7,933
3	Bali	70	21	104	110	30	335
4	Nusa Tenggara	219	134	668	199	33.5	1,254
5	Kalimantan	151	18	6	0	0	175
6	Sulawesi	1,359	350	1,032	162	150	3,053
7	Maluku	560	80	496	6	2	1,144
8	Papua	75	0	0	0	0	75
Total		5,714	3,467	9,575	1,494	3,342	23,592

Source : Geological Agency

6.5.2 Geothermal Power Plant Capacity 2023

(MW)

No	Working Area	Location	IPB Owner		Turbine Capacity	Operator Steam Area	Operator PLTP	Total Capacity
1	PLTP Kamojang	West Java	PT Pertamina Geothermal Energy (Persero)		1 × 30 MWe	PT Pertamina Geothermal Energy (Persero)	Indonesia Power	239.00
					2 × 55 MWe		Indonesia Power	
					1 × 64 MWe		PGE	
					1 × 35 MWe		PGE	
2	PLTP Darajat	West Java	PT Pertamina Geothermal Energy (Persero)		1 × 55 MWe	KKOB Star Energy Geothermal Darajat II, Ltd.	Indonesia Power	293.21
					1 × 100.71 MWe		KKOB SEGD II, Ltd.	
					1 × 137.5 MWe		KKOB SEGD II, Ltd.	
3	PLTP Salak	West Java	PT Pertamina Geothermal Energy (Persero)		2 × 60 MWe and 1 x 61 MWe	KKOB Star Energy Geothermal Salak, Ltd.	Indonesia Power	381.97
					3 × 66.99 MWe		KKOB SEGS, Ltd.	
4	PLTP Dieng	Central Java	PT Geo Dipa Energi (Persero)		1 × 60 MWe	PT Geo Dipa Energi (Persero)	GDE	72.80
					1 × 12.8 MWe			
5	PLTP Sibayak	North Sumatera	PT Pertamina Geothermal Energy		2 x 5.65 MWe	PT Pertamina Geothermal Energy (Persero)	Dizamatra Powerindo	13.30
					2 MWe (Monoblock)		PGE	
6	PLTP Wayang Windu	West Java	PT Pertamina Geothermal Energy		1 × 110 MWe	KKOB Star Energy Geothermal Wayang Windu, Ltd.	KKOB SEGWW, Ltd.	227.00
					1 × 117 MWe			
7	PLTP Patuha	West Java	PT Geo Dipa Energi (Persero)		1 × 59.88 MWe	PT Geo Dipa Energi (Persero)	GDE	59.88
8	PLTP Lahendong	North Sulawesi	PT Pertamina Geothermal Energy		4 × 20 MWe	PT Pertamina Geothermal Energy (Persero)	PLN	123.71
					2 × 21.5 MWe		PGE	
					1 x 0.71 Mwe		PGE	
9	PLTP Ulubelu	Lampung	PT Pertamina Geothermal Energy		2 × 55 MWe	PT Pertamina Geothermal Energy (Persero)	PGE	229.00
					2 × 59.5 MWe		PGE	
10	PLTP Ulumbu	East Nusa Tenggara	PT PLN (Persero)		4 × 2.5 MWe	PT PLN (Persero)	PLN	10.00
11	PLTP Mataloko	East Nusa Tenggara	PT PLN (Persero)		1 × 2.5 MWe	PT PLN (Persero)	PLN	2.50
12	PLTP Sarulla	North Sumatera	PT Pertamina Geothermal Energy		1 x 139.205 Mwe	KKOB Sarulla Operations, Ltd.	KKOB SO, Ltd.	418.14
					1 x 148.53 Mwe			
					1 x 130.4 Mwe			
13	PLTP Karaha	West Java	PT Pertamina Geothermal Energy		1 × 30 MWe	PT Pertamina Geothermal Energy (Persero)	PGE	30.00
14	PLTP Lumut Balai	South Sumatera	PT Pertamina Geothermal Energy		1 × 55 MWe	PT Pertamina Geothermal Energy (Persero)	PGE	59.93
15	PLTP Sorik Marapi	North Sumatera	PT Sorik Marapi Geothermal Power		1 x 68.8 Mwe	PT Sorik Marapi Geothermal Power	SMGP	237.85
					1 x 66.65 Mwe			
					1 x 62.8 Mwe			
					1 x 39.6 Mwe			
16	PLTP Muaralaboh	West Sumatera	PT Supreme Energy Muara Laboh		1 × 89.25 MWe	PT Supreme Energy Muara Laboh	SEML	89.25
17	PLTP Rantau Dedap	South Sumatera	PT Supreme Energy Rantau Dedap		1 × 98.4 MWe	PT Supreme Energy Rantau Dedap	SERD	98.40
18	PLTP Sokoria	East Nusa Tenggara	PT Sokoria Geothermal Indonesia		2 x 3.291 Mwe	PT Sokoria Geothermal Indonesia	SGI	11.58
					1 x 5 Mwe			
							Total	**2,597.51**

Source : Directorate General of New and Renewable Energy and Energy Conservation

6.5.3 Geothermal Steam Production

(Thousand Tonnes Geothermal Steam)

Year	Pertamina Field							KOB Field				KOB Field		PT PLN (Persero) Field			PT Geo Dipa Energy Field			Total
	Kamojang	Sibayak	Lahen-dong	Ulubelu	Karaha	Lumut Balai	Sub Total	Salak	Darajat	Wayang Windu		Sarulla	Sub Total	Ulumbu	Mataloko	Sub Total	Dieng	Patuha	Sub Total	
2013	11,256	239	3,841	5,575	-	-	20,910	23,728	10,678	13,378		0	47,785	253	-	253	348	0	348	69,296
2014	10,489	184	4,138	6,174	-	-	20,985	24,307	13,856	13,143		0	51,306	261	-	261	205	840	1,045	73,598
2015	11,974	0	4,693	6,044	-	-	22,711	24,755	13,916	7,850		0	46,521	382	41	423	1,770	2,837	4,607	74,263
2016	12,679	0	3,295	6,718	-	-	22,692	24,575	13,952	13,613		0	52,140	339	0	339	1,393	3,153	4,546	79,717
2017	12,522	0	6,059	10,187	-	-	28,768	24,655	13,871	13,526		4,877	56,929	610	0	610	2,835	2,947	5,782	92,089
2018	14,305	0	5,525	9,923	1,334	-	31,086	24,820	12,722	13,222		13,593	64,356	545	0	545	2,511	2,967	5,477	101,465
2019	13,534	0	6,628	11,290	1,192	193	32,838	22,511	13,055	12,972		11,683	60,221	679	0	679	2,570	3,003	5,574	100,157
2020	13,123	0	6,694	11,753	789	3,138	35,498	22,785	14,224	13,695		11,503	62,207	707	0	707	2,711	3,028	5,739	110,917
2021	13,869	0	6,143	11,733	733	3,252	35,731	23,836	13,929	13,552		12,747	64,064	774	0	774	2,639	2,994	5,633	114,642
2022	13,147	0	6,785	11,192	725	3,191	35,040	23,273	13,903	13,784		13,146	64,105	692	0	692	2,515	3,045	5,560	123,586
2023	13,331	0	7,056	12,143	794	3,385	36,710	24,772	14,110	13,518		11,832	64,232	705	0	705	2,564	3,388	5,952	123,020

6.5.3 Geothermal Steam Production (Continued)

Year	PT Sorik Marapi Geothermal Power		PT Supreme Energy			PT Sokoria Geothermal Indonesia		Total
	Sorik Marapi	Sub Total	Muara Laboh	Rantau Dadap	Sub Total	Sokoria	Sub Total	
2019	649	649	197	-	197	0	0	100,157
2020	2,401	2,401	4,366	-	4,366	0	0	110,917
2021	3,569	3,569	4,533	338	4,871	0	0	114,642
2022	8,196	8,196	4,719	5,051	9,770	223	223	123,586
2023	6,071	6,071	4,617	4,376	8,994	355	355	123,020

Source : Directorate General of New and Renewable Energy and Energy Conservation

6.6.1 Biofuel Production Capacity in 2023

(KL)

Province	Biodiesel	Bioethanol
Banten	568,966	-
West Java	870,899	-
Central Java	-	-
East Java	3,931,609	40,000
Bali	-	-
Riau	5,097,701	-
Batam	896,552	-
North Sumatera	911,984	-
West Sumatera	413,793	-
Lampung	1,488,506	-
East Kalimantan	2,546,695	-
Central Kalimantan	449,885	-
South Kalimantan	1,701,724	-
West Kalimantan	910,345	-
North Sulawesi	475,862	-
Total	20,264,521	40,000

Source : Directorate General of New, Renewable Energy and Energy Conservation

6.6.2 New and Renewable Energy for Non Electricity

Year	Biodiesel			BioGas	Industrial Biomass	Solar Water Heater	Direct Use of Geo-thermal
	Product-ion (Thousand KL)	Export (Thou-sand KL)	Domes-tic (Thou-sand KL)	Product-ion (Thou-sand m^3)	Consumpt-ion (Thousand Ton)	Water Heat (Thou-sand TOE)	Heat (Thermal MWh)
2013	2,805	1,757	1,048	n.a	n.a	n.a	n.a
2014	3,961	1,629	1,845	n.a	n.a	n.a	n.a
2015	1,620	328	915	18,953	47	n.a	n.a
2016	3,656	477	3,008	22,800	72	n.a	n.a
2017	3,416	187	2,572	24,786	73	n.a	n.a
2018	6,168	1,803	3,750	25,670	133	n.a	n.a
2019	8,399	1,319	6,396	26,277	217	n.a	n.a
2020	8,594	36	8,400	27,856	249	n.a	n.a
2021	10,240	133	9,294	28,390	511	n.a	n.a
2022	11,836	372	10,449	32,521	1,765	128	6,195
2023	13,151	188	12,290	110,792	7,980	261	6,195

Source : Directorate General of New and Renewable Energy and Energy Conservation

01
ANNEX

METHODOLOGY AND TABLE EXPLANATION

GENERAL METHODS

Data shown in the tables of Indonesia's energy and economic statistics are consolidated from various statistics of regular publication. The data are harmonized in format and definition as well as cover an estimate of energy demand calculated by using the macro-economic approach. These data are sourced from the statistics published by Statistics Indonesia, technical units within the Ministry of Energy and Mineral Resources, energy companies, energy associations, and some international agencies.

Statistics books used as the sources of the energy and economic data consolidation are as follows:

a. Crude Oil and Oil Products
   - Indonesia's Oil and Gas Statistics, Directorate General of Oil and Gas

b. Natural Gas (Production, utilization, and flaring)
   - Indonesia's Oil and Gas Statistics, Directorate General of Oil and Gas PT PGN Annual Report

c. Coal
   - Indonesia's Coal Statistics, Directorate General of Mineral and Coal Indonesia's Mineral and Coal Statistics, Directorate of Mineral and Coal Enterprises

d. Biomass
   - National Survey on Social & Economic Issues (Survei Sosial dan Ekonomi Nasional. SUSENAS) Statistics Indonesia, 1993, 1996, 1999, 2002

e. LPG
   - Indonesia's Oil and Gas Statistics, Directorate General of Oil and Gas

f. Electricity
   - PLN Statistics
     Statistics of Electricity, Directorate General of Electricity

g. General
   - Indonesia Statistics, Statistics Indonesia Finance and Economic Statistics, Bank Indonesia (www.bi.go.id) Trade Statistics, Ministry of Trade

h. Renewable Energy
   - Renewable Energy Statistics, Directorate General of New, Renewable Energy, and Energy Conservation

TABLE 2: ENERGY BALANCE TABLE

Energy balance table is a table of energy input-output system. The rows indicate the activities of an energy commodity which consist of four main elements, namely primary energy activity, transformation, own use & losses, and energy consumption, while the columns indicate the types of energy. Energy balance is presented to fully depict the energy activities in a region.

ENERGY BALANCE

DEFINITIONS BY COLUMN

Each column of the energy balance table represents one type of energy. It begins from the left with renewable energy, followed by solid energy, gaseous energy, liquid energy, and electricity.

RENEWABLE ENERGY

Hydropower is energy derived from flowing water. Hydropower plants consist of two basic configurations: with dams and reservoirs, or without. Hydropower dams with a large reservoir can store water over short or long periods to meet peak demand. The amount of hydro energy required to generate electricity is equivalent to that of fossil energy to do the same.

Geothermal energy is good energy produced from the magma inside the earth in the volcanic areas. The hot and high pressure steam emitted from the production well head can be utilized to propel the steam turbine in a geothermal power plant or be used directly for drying agriculture products.

Solar power is the conversion of energy from sunlight into electricity, either directly using photovoltaics (PV), indirectly using concentrated solar power, or a combination of both. Concentrated solar power systems use lenses or mirrors and tracking systems to focus a large area of sunlight into a small beam. Photovoltaic cells convert light into an electric current using the photovoltaic effect. The amount of solar energy required to generate electricity is equivalent to that of fossil energy to do the same.

Wind power is the use of air flowing through wind turbines to provide the mechanical power to turn electric generators and, traditionally, to do other work like milling or pumping. Wind power is, as an alternative to burning fossil fuels, plentiful, renewable, widely distributed, and clean. It produces no greenhouse gas emissions during operation, consumes no water, and uses little land. The net effects of wind power on the environment are far less problematic than those of fossil fuel sources. The amount of wind energy required to generate electricity is equivalent to that of fossil energy to do the same.

Other renewable energy is generally used in small-capacity power plants, for example biomass power plants (PLTBm), BioGas power plants (PLTBg), waste power plants (PLTSa), and hybrid power plants. PLTBm is a thermal power plant that uses fuel wood as primary energy, while PLTBg uses oil palm waste and livestock manure as primary energy, and PLTSa uses waste. The amount of other renewable energy required to generate electricity is equivalent to that of fossil energy to do the same.

Solar-powered energy-saving lamp (*Lampu Tenaga Surya Hemat Energi*/ LTSHE) is a lighting device in the form of integrated lights with batteries whose energy is sourced from photovoltaic solar power plants. The LTSHE works by capturing the energy from the sun in solar panels, converts the solar energy into electrical energy which is then stored in a battery. The electrical energy inside this battery is then used to turn on the lights. Meanwhile, solar-powered street lighting (*Penerangan Jalan Umum Tenaga Surya*/PJUTS) is a street lighting lamp that uses sunlight as the source of electrical energy.

Traditional Biomass is a renewable, organic material-based fuel. Biomass includes, among others, firewood (wood, wood waste, charcoal), agriculture wastes (rice hulls, rice straw, palm fronds, coconut shell, etc.), urban solid waste, and industrial waste. The data of biomass consumption in the household sector has been calculated based on the approach of the National Socio-Economic Survey (*Survei Sosial Ekonomi Nasional/ SUSENAS*) and the share of biomass use in the household sector.

Industrial biomass is biological material derived from animals, plants, or algae, such as wood and crops, and organic waste from cities and industries. Wood chips, wood pellets, agricultural and forestry residues, and other solid forms of bioenergy that can be used as raw materials for the industry are examples of industrial biomass.

Solar water heater is a water heater that utilizes sunlight.

Direct utilization of geothermal energy is an activity of exploiting geothermal energy directly without carrying out the process of converting heat and or fluid energy into other types of energy for non-electrical purposes.

SOLID ENERGY

Coal consists of hard coal and lignite. Data on the volume of coal is only available in aggregate number. In the energy balance table, the conversion factor used is the average of Indonesian coal calorific factor (4,276 BOE per Ton Coal). Detailed category and specification of coal available in Indonesia are as follows:

- Hard coal is a type of coal that has a calorific value of more than 5,700 kcal/kg (23.26 MJ/kg). Hard coal consists of steam coal, coking coal, bituminous coal, and anthracite.
- Steam coal is a type of coal that is used in boiler, steam generator and furnace. This category includes anthracite and bituminous coal. Steam coal has a gross calorific value of more than 23,865.0 kJ/kg (5,700 kcal/ kg), lower than that of coking coal.

- Coking coal is a type of coal that is used to produce material that reduces coke in blast furnace. Its gross calorific value is higher than 23,865 kJ/kg (5,700 kcal/kg), ash free. Sub-bituminous coal is a type of coal that has a gross calorific value between 17,435.0 kJ/kg (4,165 kcal/kg) and 23,865.0 kJ/kg (5,700 kcal/kg). Anthracite is a type of coal that has similar characteristics to those of steam coal.
- Lignite is a type of coal that has a gross calorific value of less than 4,165 kcal/kg (17.44 MJ/kg) and volatile matter of more than 31%, dry basis. Lignite is often called low-rank coal or brown coal.
- Coke is the product of high temperature carbonization of steam coal. Coke is used as reducing agent in steel plants.
- Briquettes is the fuel produced by briquetting sub-bituminous coal, lignite, or peat through the process of carbonization or powdering. Briquette is more convenient to use and has better quality than its raw materials.

GASEOUS ENERGY

Gaseous energy includes natural gas and town gas. Natural gas generally consists of methane mined from underground accumulation, and associated gas from oil production, as well as coal bed methane. Town gas includes all kinds of gas, such as gas produced from carbonization process, gasification of petroleum oils, and chemical conversion of hydrocarbon fossil fuels.

LIQUID

Crude oil is a mineral oil consisting of a mixture of hydrocarbons with blackish green color and a range of density and viscosity. It is the raw material for producing oil fuels (*Bahan Bakar Minyak*/BBM) and petrochemical products.

Condensate is a kind of liquid hydrocarbon which includes Natural Gas Liquid (NGL). NGL consists of ethane, propane, butane, pentane, and natural gasoline.

OIL FUELS/Petroleum Products, (BBM), The energy balance table contains petroleum products used for energy, namely AvGas, Avtur, Mo-gas (Motor gasoline, Gasoil (HSD/ADO), Medium Distillate Fuel (MDF/IDO),Fuel Oil, and Kerosene. Detailed description of each fuel is as follows:

AvGas (aviation gasoline) is aircraft fuel that consists of light hydrocarbons distilling between 100°C and 250°C. The distilled product contains at least 20% of the volume at 143°C.

Avtur is jet aircraft fuel which consists of hydrocarbon middle distillates having similar distillation and flash point characteristics as those of kerosene, with a maximum aromatic content of 20% of the volume. It has a freezing point of less than –47°C and octane number between 80–145 RON.

Mogas (motor gasoline) is a light hydrocarbon used in the internal combustion engine of motorized vehicles (excluding aircrafts). Mogas is distilled at a temperature between 35°C and 215°C and processed in Reformer, Catalytic Cracking, or Blending with aromatic fraction to achieve a high octane number. In the Indonesian markets, three gasoline types are available, namely RON 88, RON 92, and RON 95.

Diesel Oil is a refinery product containing heavy gasoil. This type of fuel is obtained from the lowest fraction of crude oil distilled at atmospheric pressure, while the heavy gasoil is obtained from the vacuum residue of crude oil distilled at atmospheric pressure. On the market, diesel oil is divided into Gasoil CN 48 (Minyak Solar) and Medium Distillate Fuel (MDF) which include Industrial Diesel Oil (IDO/Minyak Diesel).

Fuel Oil (FO) is oil made from the distillation of residue. This type of fuel includes all kinds of residues including those from blending. FO has viscosity of about 10 cSt at SOT. Its flash point is higher than SOT and its density is more than 0.9.

Kerosene is the fuel produced from crude oil distillation having volatility between the volatility of gasoline and that of gasoil. It has a distillation range between 150°C and 300°C, where a minimum of 65% of the volume is distilled at 250°C. It has specific gravity of 0.8 and flash point of over 38°C.

LPG is light hydrocarbon fraction of crude oil, produced at oil refinery, consisting of either propane (C_3H_8) and butane (C_4H_{10}) or a mixture of both. In addition to oil refinery, LPG is also produced from natural gas purification.

Electricity is the electric power generated by various kinds of power plants, such as Hydro Power Plant (*Pembangkit Listrik Tenaga Air*/PLTA), Geothermal *Power Plant (Pembangkit Listrik Tenaga Panas Bumi*/PLTP*), Solar Power Plant (Pembangkit Listrik Tenaga Surya*/PLTS), Wind Power Plant (*Pembangkit Listrik Tenaga Bayu*/PLTB), Biomass Power Plant (*Pembangkit Listrik Tenaga Biomassa*/ PLTBm), BioGas Power Plant (*Pembangkit Listrik Tenaga BioGas*/PLTBg), Waste Power Plant (*Pembangkit Listrik Tenaga Sampah*/PLTSa), Gas Power Plant (*Pembangkit Listrik Tenaga Gas*/PLTG), Gas Steam Power Plant *(Pembangkit Listrik Tenaga Gas Uap*/PLTGU), Coal Steam Power Plant (*Pembangkit Listrik Tenaga Uap*/PLTU), and Diesel Power Plant (*Pembangkit Listrik Tenaga Diesel*/ PLTD), etc. The capacity data displayed in the table is in accordance with those stated in the power plant construction permit.

LNG (Liquefied Natural Gas) is the liquid produced by liquefying natural gas at a temperature of -160T to facilitate its transportation over very long distances.

Total is the sum of all columns in certain row. In the energy transformation row, the total of all columns indicates the efficiency of the transformation process.

DEFINITIONS BY ROW

Total Primary Energy Supply equals domestic production plus import minus export minus bunker and minus/plus stock change. Data on bunker and stock change are not available. Production refers to the total gross primary energy produced (extracted) from the earth. Import refers to the energy obtained from other countries, not including energy in transit. Export refers to the energy sold to other countries.

Domestic supply is defined as indigenous production + from other sources + imports – exports – international marine bunker – international aviation bunker ± stock change. Production is defined as the capture, extraction, or manufacture of fuel or energy in a form that is ready for general use.

ENERGY TRANSFORMATION

Transformation refers to the transformation process of primary energy into final energy. Transformation includes the processes in LPG plants, and carbonizing plants. Input has a negative sign while production has a positive sign.

Oil Refining refers to the processing of crude oil and condensate to produce oil fuels such as naphtha, AvGas, Gasoil, MDF, IDO, mogas, kerosene, fuel oil, LPG, etc. The consumption of energy such as natural gas and naphta is also included.

Gas Processing (at LNG plants and LPG plants) refers to the process of liquefaction or purification of natural gas to produce LNG or LPG.

Power Generation is the transformation of energy into electric power. The row records the quantity of consumed fuels (coal, oil fuels, natural gas, hydropower, geothermal power, biomass, wind, photovoltaic (solar energy), BioGas, waste, etc.) and the amount of electricity generated which includes the electricity from on-grid and off-grid systems. The data on electricity production from off-grid power plants are obtained through a data capacity approach. In 2018, data on production and electricity capacity from off-grid power plants emerged as a result of off-grid power plant inventory with the aim of calculating the national energy mix.

Biofuel Blending is the quantity of liquid biofuels which are not delivered for the final consumption but are instead used by other petroleum products as reported in the oil questionnaire.

LNG Regasification is a process of converting Liquefied Natural Gas (LNG) at a temperature of -162°C back to natural gas at atmospheric temperature.

OWN USE AND LOSSES

Own Use and Losses include own uses and losses in primary energy production and transformation processes.

- Losses in Production are losses that occur due to transportation, distribution, and transfer by pipe. Own use in Production includes all energy consumed in the field (off-road transportation, genset, boiler, etc.), while all energy consumed in transportation is computed in the Transportation Sector.
- Losses in Oil Refining are losses that occur due to transportation, distribution, and transfer by pipe. Own use in Oil Refining is all energy consumed in the oil refining processes.
- Losses in Gas Processing are losses that occur due to transportation, distribution, and transfer by pipe. Own use in Gas Processing is all energy consumed in the gas processing.
- Losses in Electricity System are losses occurred in transformer, transmission, and distribution network.
- Own use in Electricity Generation is all energy consumed within a power plant area.

Statistical Difference is the difference between net supply (production + import – export – transformation input + transformation production – own use and losses) and total final consumption (household, commercial, industry, and transportation).

FINAL ENERGY CONSUMPTION

Total Final Energy Consumption is the quantity of energy consumption by household, commerce, industry, and transportation sectors as well as non-energy consumption.

Household consumption refers to all energy consumption by households, excluding consumption by private cars.

Commercial consumption refers to the energy consumption by commercial units such as the markets, hotels, restaurants, financial institutions, government agencies, schools, hospitals, etc.

Industry consumption refers to the energy consumption by the following industrial subsectors (excluding transportation): iron and steel, chemical, non-iron metal, non-metal production, machine and equipment, non-energy mining and quarrying, food, paper, wood, petrochemical, textile, etc.

Transportation consumption refers to the energy consumption by all transportation activities in all economic sectors. Transportation subsectors are air transportation, land transportation (motor-cycles, cars, buses, and trucks), ferries, and railway transportation. The consumption by the fishery, construction, and mining subsectors is also included in the transportation consumption.

Non-energy consumption refers to the energy consumption for non-energy uses, such as hydrocarbons or coal used as lubricating oils or raw materials (naphtha, natural gas, and cokes), and gas used as raw material for petrochemical products (methanol and ammonia/urea).

02
ANNEX

GLOSSARY

AvGas
Aviation gasoline; special high-octane gasoline for aircraft reciprocating engines; has high stability, low freezing point, and a rather flat distillation curve.

Avtur
Aviation turbine fuel; special fuel for turbine/jet aircraft; special kerosene with a distillation range of 150°C - 250°C.

Biomass
Collective name for firewood, agriculture waste (rice husks, rice stems, palm fronds, coconut shells), black liquor, wood chips, wood barks.

BOE (Barrel Oil Equivalent)
Calorific equivalent of a barrel of crude oil.

Captive Power Plant
A power plant owned by an industry to produce electricity for its own use.

Coal
Sedimentary rocks originated from piles of wood since millions of years ago.

Coal Transformation
Processing of coal (coking coal, steam coal, sub-bituminous coal, and lignite) to produce coke, blast furnace gas, and briquette.

Commercial
A group of energy consumers which uses energy for lighting, air conditioning, mechanical equipment, cooking appliance, and water heating, but not including consumption for vehicles/ transportation. Energy consumers included in this group are commercial and general businesses, such as market, hotel, restaurant, financial institution, government agency, school, hospital, etc.

Condensate
Liquid extracted from natural gas; may be in the form of liquid petroleum gas or natural gasoline.

Conversion Factor
Factors used to convert physical units, such as liter, barrel, ton, and cubic meter, to energy units, such as Joule, BTU, ton coal equivalent (TCE), or barrel or ton oil equivalent (BOE or TCE).

Crude Oil
A mixture of hydrocarbons occurring in liquid phase in the subsurface reservoir and one that remains liquid under atmospheric pressure.

Diesel Oil
A refinery product which contains heavy gasoil, and available as gasoil CN 48 or Medium Distillate Fuel (MDF) and include industrial diesel oil (IDO).

DPPU
Depo Pengisian Bahan Bakar Pesawat Udara (Aircraft Refueling Depot), a depot serving AvGas and avtur for aircraft consumption.

Electricity
Electric power generated by electric power plants, such as Hydro Power Plant (PLTA), Geothermal Power Plant (PLTP), Solar Power Plant (PLTS), Wind Power Plant (PLTB), Gas Power Plant (PLTG), Gas Steam Power Plant (PLTGU), Coal Steam Power Plant (Coal PLTU), Diesel Power Plant (PLTD), etc.

Energy Balance Table
The energy system's input-output table; the rows indicate the activities of an energy commodity which consists of four main elements, namely primary energy, transformation, own use & losses, and energy consumption. The columns indicate the type of energy commodity.

Final Energy
Energy which can be directly consumed by user.

Final Energy Consumption
Energy consumption of the four sectors of energy consumers, namely household sector, commercial sector, industry sector, and transportation sector as well as the consumption of energy as raw material and reduction agent. In compiling the Energy Planning of Riau, the household sector is combined with the commercial sector due to the limited data obtained.

Final Stock
Total stock at the end of the year.

Fuel Oil
The lowest order of refinery product; heavy distillate, residue, and their mixture which are used as the fuel in industrial furnace and electric power plant.

Gasoil CN 48
A type of diesel oil with Cetane Number 48 used as the fuel for high-speed diesel engine.

Gasoline
(see mogas)

Gas Process
At LNG plant or LPG plant; liquefaction or purification process to produce LNG and LPG.

GDP at Constant Price
Added value of goods and services computed on the basis of prices in a certain year.

GDP, Nominal (based on current price)
Added value of goods and services computed on the basis of prices in each year.

Goods and Services Export
All transfer and sale of goods and services from a resident of a country to a resident of another country, including those conducted in the same

country or in another country. Value of goods export is based on FOB.

Government Consumption
Expenditures for employee expenses, depreciation and purchase of goods and services (including travel expenses, maintenance and other routine expenditures), spent by central government or regional governments, but excluding revenue from the production of goods and services.

Household
A group of energy consumers which uses energy for cooking, lighting, and household appliances, but excluding energy consumption for private cars.

Hydropower
Hydropower is energy derived from flowing water. Hydropower plants consist of two basic configurations: with dams and reservoirs, or without. Hydropower dams with a large reservoir can store water over short or long periods to meet peak demand.

Import
Purchase from other countries, excluding goods in transit.

Industry
A group of energy consumers which uses energy for industrial processes, such as steam boiling, direct heating, lighting, and the driving force of mechanical equipment, but does not include the energy used for electricity generation by industries; such as iron and steel, chemical, non-iron metal, non-metal production, food, paper, wood, construction, textile etc.

Initial Stock
Total stock at the beginning of the year.

International Bunker
The energy consumption for international shipping; supplied to international ships for all ships bearing any flag.

Kerosene
A type of oil fuel produced from distillation process; its volatility lies between the volatility of motor gasoline (mogas) and that of diesel oil; used as fuel for lighting, kitchen stove, and outboard engine.

Losses in Electricity Generation
Losses that occur in transformer, transmission, and distribution network.

LPG
Liquefied Petroleum Gas; light hydrocarbons from crude oil; produced from oil refinery process or purification process of natural gas; consisting of either propane (C3H8) and butane (C4H10) or a mixture of both.

LNG Regasification
A process of converting Liquefied Natural Gas (LNG) at -162°C temperature back to natural gas at atmospheric temperature.

LSWR
Low Sulphur Waxy Residue; a by-product of oil refining.

Medium Distillate Fuel (MDF)
A type of diesel oil used as fuel in low or medium speed industrial diesel engine (IDO) and marine engine.

Mogas
Motor gasoline; light hydrocarbon oil used in internal combustion engine, except aircraft engine; available in the market as gasoline RON 88, gasoline RON 90, gasoline RON 92, and gasoline RON 95.

Natural Gas
All kinds of hydrocarbon gas produced from wells; a mixture of hydrocarbon gas and vapor occurring naturally which main components are methane, ethane, propane, butane, pentane, and hexane; mined from underground accumulation either directly or as associated gas in oil mining.

Natural Gas Liquid
(see Condensate)

Non-energy Consumption
Non-energy consumption includes consumption of lubricating oil, raw material for petrochemical industry (naphtha, natural gas, and coke), and gas consumed as chemical raw materials (methanol and ammonia/urea).

Non-renewable Energy
Energy which reserves cannot be brought back into original condition; generally consists of fossil energy.

Oil Refinery
Crude oil or condensate processing unit to produce oil fuels, such as naphtha, AvGas, avtur, gasoil CN 48, MDF, mogas, kerosene, fuel oil, LPG, etc.

Other Oil Products (OOP)
Other refinery products, such as naphtha, lubricating oil, bitumen, paraffin, etc. (sulphur, grease).

Own Use and Losses
A category that includes energy losses and the energy used in primary energy production field and in each transformation.

Own Use in Electricity Generation
Own use refers to the amount of energy consumed in power plant and in the transmission and distribution sub-stations.

Own Use and Losses in Gas Processing
Losses that occur due to transportation, distribution, and transfer by pipe. Own use refers to the amount of energy consumed in gas processing.

Own Use and Losses in Oil Refinery
Losses that occur due to transportation, distribution, and transfer by pipe. Own use refers to the amount of energy consumes in oil refinery processes.

Own Use and Losses in Production Field
Losses that occur due to transportation, distribution, and transfer by pipe. Own use refers to the amount of energy consumed in production field.

PLN Power Plant
Electric power plant owned by PT PLN (Persero) to produce electricity for sale to the public.

Primary Energy
Energy in its original form extracted by means of mining, dam, or renewable energy utilization.

Private Sector Power Plant
Power plant owned by private sector to produce electricity for sale to the public. Known as Independent Power Producer (IPP).

Production
Total gross primary energy extracted/produced.

Renewable Energy
Energy which reserve can be brought back into original condition.

SBM
(see BOE)

Secondary Energy
Energy which has undergone transformation process into other form of energy.

SPBU
Stasiun Pengisian BBM Umum, public oil fuel refueling station, which sells gasoline (RON 88, RON 90, RON 92, and RON 95) and gasoil (CN 48).

Solar-Powered Energy Saving Lamp
A lighting device in the form of integrated lights with batteries whose energy is sourced from photovoltaic solar power plants.

Solar-Powered Street Lighting
A street lighting lamp that uses sunlight as a source of electrical energy.

Statistical Difference
Difference between net supply (production + import – export – international bunker – stock change – consumption for transformation + production from transformation – own use – losses) and total final consumption.

Stock Change
Difference between the stock in the beginning and at the end of the year. Stock decrease in energy balance is shown by positive sign which means there is an increase in supply, while stock increase is shown by negative sign which means there is a decrease in supply.

Sub-bituminous coal
A type of coal which has calorific value of 5,000–6,000 kcal/kg.

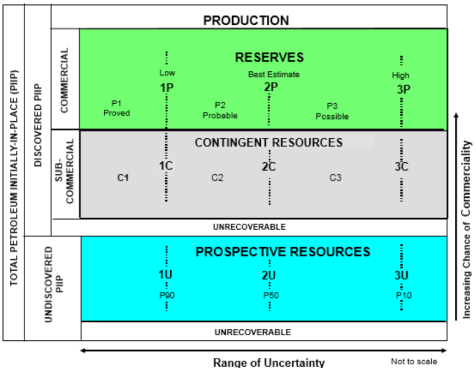
Total Energy Balance
Total of all columns in a certain row. In transformation row, the total of columns indicates efficiency of the transformation process.

Total Final Energy Consumption
Sum of energy consumption in the following sectors: household, commercial, industry, transportation, and non-energy consumption.

Total Primary Energy Supply
Local production plus import less export less bunker and less or plus stock change.

Transportation
A group of energy consumers which uses energy for transportation vehicles.

Oil and Gas Classification Reserves Based on Petroleum Resources Management System 2018



03
ANNEX

Conversion Factor

Energy	Original Unit	Multiplier Factor to BOE (Barrel Oil Equivalent)
Coal		
Anthracite	Ton	4.9893
Imported Coal	Ton	4.2766
Kalimantan Coal[1)]	Ton	4.2000
Ombilin Coal	Ton	4.8452
Tanjung Enim Coal	Ton	3.7778
Lignite	Ton	3.0649
Riau Peat	Ton	2.5452
Briquette	Ton	3.5638
Average Coal	Ton	3.4554
Biomass		
Charcoal	Ton	4.9713
Firewood	Ton	2.2979
Natural Gas	MSCF	0.1796
Gas Products		
City Gas	Thousand KCal	0.0007
CNG	Thousand KCal	0.0007
LNG	Ton	8.0532
LNG	MMBTU	0.1796
LPG	Ton	8.5246
Oil		
Condensate	Barrel	0.9545
Crude Oil	Barrel	1.0000

Conversion Factor (continued)

Energy	Original Unit	Multiplier Factor to BOE (Barrel Oil Equivalent)
Oil Fuel		
Aviation Gasoil (AvGas)	Kilo Liter	5.5530
Aviation Turbine Gas (Avtur)	Kilo Liter	5.8907
Super TT	Kilo Liter	5.8275
Premix	Kilo Liter	5.8275
Premium	Kilo Liter	5.8275
Kerosene	Kilo Liter	5.9274
Gasoil	Kilo Liter	6.4871
MDF	Kilo Liter	6.6078
FO	Kilo Liter	6.9612
Oil Products		
Other Oil Products	Barrel	1.0200
Refinery Fuel		
Refinery Fuel Gas (RFG)	Barrel	1.6728
Refinery Fuel Oil (RFO)	Barrel	1.1236
Feed Stock	Barrel	1.0423
Electric Power	MWh	0.6130

Source : Neraca Energi 1990-1994, Department of Mining and Energy
Note : 1) Before 2022, using 4,2 as multiplier factor to BOE

Ministry of Energy and Mineral Resources
Republic of Indonesia

HANDBOOK OF ENERGY & ECONOMIC STATISTICS OF INDONESIA 2023

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